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PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty Information

For information concerning the list of PCT member countries and the most recent PCT rule changes see the notice appearing at 1001 O.G. 14 in the OFFICIAL GAZETTE of Dec. 9, 1980.

Note that the international fees have been increased as of Jan. 1, 1981. The current schedule of fees is as follows:

Transmittal fee	$ 35.00
Search fee	$300.00
International fees:	
Basic fee (first 30 pages)	$265.00
Basic supplemental fee (for each sheet over 30)	$ 5.00
Designation fee	$ 64.00

SIDNEY A. DIAMOND,
Commissioner of Patents and Trademarks.

Jan. 13, 1981.

Continuation-in-Part Application Oath or Declaration; Revised Notice of Proposed Rulemaking

37 CFR PARTS 1 AND 3

AGENCY: Patent and Trademark Office, Commerce.

ACTION: Proposed rulemaking.

SUMMARY: Patent and Trademark Office again proposes amendment of the rules of practice and forms for patent cases to specify certain additional requirements of an oath or declaration for continuation-in-part applications. The change is being proposed in view of various court decisions which have interpreted what material is available as references in continuation-in-part applications. The proposed change will clarify what matter must be disclosed by applicants in continuation-in-part applications.

DATES: Written comments by Mar 31, 1981.

ADDRESSES: Address written comments to the Commissioner of Patents and Trademarks, Washington, D.C. 20231. No additional hearing will be held since a hearing has already been held on Feb. 7, 1979. Written comments and transcript of hearing will be available for public inspection in Room 11E10 of Building 3, Crystal Plaza, at 2021 Jefferson Davis Highway, Arlington, Va.

FOR FURTHER INFORMATION CONTACT: Mr. Louis O. Maassel by telephone at (703) 557–3070, or by mail marked to his attention and addressed to the Commissioner of Patents and Trademarks, Washington, D.C. 20231.

SUPPLEMENTARY INFORMATION: This notice proposes to amend § 1.65 by revising paragraph (a) and by adding a new paragraph (d) and to revise forms 3.18 and 3.18a. Notice was previously given on Nov. 28, 1978 in the Federal Register (43 FR 55417–55420) of a proposal to amend these sections of Title 37 of the Code of Federal Regulations. However, this proposal was not published in the OFFICIAL GAZETTE. As stated in the proposal, the changes are intended to more clearly specify the requirements of an oath or declaration accompanying a continuation-in-part application.

The reasons for the change are set forth in the following discussion.

Any claim in a continuation-in-part application which is directed *solely* to subject matter adequately disclosed under 35 U.S.C. 112 in the parent application is entitled to the benefit of the filing date of the parent application. However, if a claim in a continuation-in-part application recites a feature which was not disclosed or adequately supported by a proper disclosure under 35 U.S.C. 112 in the parent application, but which was first introduced or adequately supported in the continuation-in-part application such a claim is entitled only to the filing date of the continuation-in-part application. *In re von Langenhoven*, 458 F.2d 132, at 136, USPQ 426 at 429 (CCPA 1972) and *Chromalloy American Corp.* v. *Alloy Surfaces Co., Inc.*, 339 F. Supp. 859 at 874, 173 USPQ 295 at 306 (D. Del. 1972).

An illustration of the effects of these and other cases is as follows: An application is filed which discloses the combination AB. Within the priority year a foreign application to the combination AB is filed by applicant and later published. More than one year after the foreign publication, but still during the pendency of the parent United States application, a second United States application is filed by the same inventor which discloses and claims the combination AC and is therefor designated a continuation-in-part application.

Upon examination of the continuation-in-part application, the examiner concludes that C is in fact a known element in the art and that it would be obvious to substitute C for B in the combination AB.

A claim drawn to AC finds no support in the parent case and therefore carries an effective date only as early as the filing of the continuation-in-part application. Therefore, the publication of AB in the foreign application more than one year prior to the filing of the continuation-in-part application is prior art under 35 U.S.C. 103 by reason of the provisions of 35 U.S.C. 102(b) and, together with a showing that C is old, may provide basis for rejection of a claim to AC for obviousness. Similarly, public use or sale of AB in the United States more than one year prior to the filing of the continuation-in-part application would be prior art under 35 U.S.C. 103 by reason of 35 U.S.C. 102(b). And the grant of a foreign patent or inventor's certificate on AB, based on a foreign application filed more than twelve months prior to and issued before filing the continuation-in-part application would be prior art under 35 U.S.C. 103 by reason of 35 U.S.C. 102(d). It is for these reasons that applicants must supply information concerning the common subject matter relative to the continuation-in-part filing date in those instances where any of the claims recite additional subject matter and are thereby only entitled to the continuation-in-part filing date. This proposed change would not require applicant to supply any kind of information in addition to that required by the current rules. Only the date relative to which the information must be supplied is being changed.

By way of further illustration, if the claims of a continuation-in-part application which are only entitled to the continuation-in-part filing date, "read on" such published, publically used or sold, or patented subject matter (e.g., as in a genus-species relationship) a rejection under 35 U.S.C. 102 would be proper. Cases of interest in this regard are *In re Steenbock*, 83 F.2d 912, 30 USPQ 45 (CCPA 1936); *In re Ruscetta*, 255 F.2d 687, 118 USPQ 101 (CCPA 1958); *In re Hafner*, 410 F.2d 1403, 161 USPQ 783 (CCPA 1969); *In re Lukach*, 442 F.2d 967, 169 USPQ 795 (CCPA 1971); and *Ex parte Hageman*, 179 USPQ 747 (Bd. App. 1971).

In addition, knowledge, use or patenting by another before the applicant's invention of additional subject matter claimed in the continuation-in-part application would also constitute prior art although such activity may not necessarily be known to the applicant.

In view of the above, § 1.65 is proposed to be amended by the addition of a paragraph (d) which requires the applicant in a continuation-in-part application, which both discloses and claims subject matter in addition to that disclosed in the prior copending application, to make an oath or declaration as of the filing date of the continuation-in-part application. Corresponding changes are being made in the oath and declaration forms in Part 3 of 37 CFR.

It is recognized that all of the information called for in the proposed forms would not be required by § 1.65(d) in some cases, such as where there is additional disclosure in the continuation-in-part application but where all claims are directed to the common subject matter disclosed in the parent application. In such instance §1.65(d) does not require any statements in the oath or declaration as to the

common subject matter as of the continuation-in-part filing date, and the applicant may modify the forms, if desired, so that the statements referring to the common subject matter are made with reference to the filing date of the parent application. However, the use of the proposed forms in these cases would act as a safeguard for applicant, since he may later amend his claims to recite some of the additional disclosure. Similarly, the examiner might disagree with applicant's conclusion that additional subject matter is not being claimed in the continuation-in-part application. For this reason and the possibility that confusion might be generated by multiple forms, no specific forms are proposed for use in the case where all of the claims in the continuation-in-part application may be entitled to the filing date of the parent application.

Where activity has occurred in connection with an invention, but is not believed to constitute prior art within the meaning of Section 102 of Title 35, United States Code (such as a prior public use or sale of an experimental nature more than one year before the date of the application), such activity may be referred to in the continuation-in-part oath or declaration with any qualifications about its prior art status deemed warranted, or it need not be mentioned in the oath or declaration at all. If such activity is not mentioned in the continuation-in-part oath or declaration but is material to the examination under 37 CFR 1.56 it, of course, must be called to the Office's attention in a separate paper.

RESPONSE TO SUBSTANTIVE PUBLIC COMMENTS RECEIVED

Written comments have already been received from seven individuals and organizations. Two individuals presented oral comments at the hearing.

The many comments objecting to the best mode requirement acknowledgment are not mentioned here since this acknowledgment requirement has been deleted in this proposal. For the time being, no further action is being taken on this item.

Proposed paragraph (a) of 37 CFR 1.65 is being revised to provide for both masculine and feminine gender.

A number of comments were directed to the argument that the examiners would misapply the provided information. The response to this line of argument is that the proper application of references is something that must be decided currently by patent examiners in the normal course of patent examination. It is not seen that the adoption of this rule change would result in any new problems.

The proposed forms are examples of forms which would meet the requirements of proposed § 1.65(d). The forms could be modified by applicant to handle specific situations such as where no additional subject matter is being claimed.

This proposal is being republished to clarify the intent and scope of the proposed changes and to provide additional opportunity for comments to be received from the public.

DIFFERENCES BETWEEN THE EARLIER PROPOSAL AND THIS PROPOSAL

Proposed paragraph (a) of § 1.65 differs from the earlier proposal in that the sentence acknowledging the requirement to disclose the best mode of the invention is not included. The best mode provision has also been deleted from the proposed forms of §§ 3.18 and 3.18a. *Classification.* Under the regulations of the Department of Commerce, this rulemaking proposal is deemed to be significant. *Regulatory Analysis.* The Patent and Trademark Office has determined that the proposed amendment of 37 CFR Parts 1 and 3 would not have major economic impact and therefor does not require a regulatory analysis.

For the foregoing reasons, and under the authority granted to the Commissioner of Patents and Trademarks by 35 U.S.C. 6, §§ 1.65, 3.18, and 3.18(a) of Title 37 CFR are proposed to be amended as follows:

In the texts of the following proposed amendments to § 1.65, additions are indicated by arrows and deletions are indicated by brackets. The changes to §3.18 and § 3.18(a) are not noted in this manner because of numerous changes in wording.

PART 1—RULES OF PRACTICE IN PATENT CASES

1. Section 1.65 is proposed to be amended by revising paragraph (a) and by adding a new paragraph (d) to read as follows:

§ 1.65 *Oath or Declaration*

(a)(1) The applicant, if the inventor, must state that [he] ►the applicant◄ verily believes himself ►or herself◄ to be the original and first inventor or discoverer of the process, machine, manufacture, composition of matter, or improvement thereof, for which [he solicits] a patent ►is solicited◄; that ►the applicant◄ [he] does not know and does not believe that the same was ever known or used in the United States before ►the applicant's◄ [his] invention or discovery thereof, and shall state of what country ►the applicant◄ [he] is a citizen and where ►the applicant◄ [he] resides and whether ►the applicant◄ [he] is a sole or joint inventor of the invention claimed in the application. In every original application the applicant must distinctly state that to the best of ►the applicant's◄ [his] knowledge and belief the invention has not been in public use or on sale in the United States more than one year prior to ►the◄ [his] application or patented or described in any printed publication in any country before ►the applicant's◄ [his] invention or more than one year prior to ►the◄ [his] application, or patented or made the subject of an inventor's certificate in any foreign country prior to the date of ►the◄ [his] application on an application filed by ►the applicant◄ [himself] or ►the applicant's◄ [his] legal representatives or assigns more than twelve months prior to ►the◄ [his] application in this country. ►The applicant◄ [he] must acknowledge ►the◄ [a] duty to disclose information ►the applicant◄ [he] is aware of which is material to the examination of the application. ►The applicant◄ [He] shall state whether or not any application for patent or inventor's certificate on the same invention has been filed in any foreign country, either by ►the applicant◄ [himself] or ►the applicant's◄ [his] legal representatives or assigns. If any such application has been filed, the applicant shall name the country in which the earliest such application was filed, and shall give the day, month, and year of its filing; ►the applicant◄ [he] shall also identify by country and by day, month, and year of filing, every such foreign application filed more than twelve months before the filing of the application in this country.

(2) This statement (i) must be subscribed to by the applicant, and (ii) must either (a) be sworn to (or affirmed) as provided in § 1.66 or (b) include the personal declaration of the applicant as prescribed in § 1.68. See § 1.153 for design cases and § 1.162 for plant cases.

* * * * *

►(d) An applicant in a continuation-in-part application filed under the conditions specified in 35 U.S.C. 120 which discloses and claims subject matter in addition to that disclosed in the prior copending application, must identify the prior copending application and make an oath or declaration which includes the statements required by paragraph (a) of this section, or a list of the exceptions to the statements, (1) as to the common subject matter and (2) as to the noncommon subject matter. The statements must be made in reference to the filing date of the continuation-in-part application in both cases (1) and (2).◄

PART 3—FORMS FOR PATENT CASES

2. Section 3.18 is proposed to be revised to read as follows:

§ 3.18 *Oath in copending application containing additional subject matter*

[This form of oath may be used with an application disclosing additional subject matter to that disclosed in a prior copending application of the same inventor.]

As a below named inventor, I hereby state that:

My residence, post office address and citizenship are as stated below next to my name;

I verily believe that I am the original, first and sole inventor (if only one name is listed below) or a joint inventor (if plural inventors are named below) of the invention entitled: ----------
described and claimed in the attached specification.

That I acknowledge my duty to disclose information of which I am aware which is material to the examination of this application.

This application discloses subject matter in addition to that disclosed in my or our earlier filed pending application(s), Serial > No. ----------, filed ----------;

As to the claimed subject matter of this application which is common to said earlier application, I do not know and do

not believe that the same was ever known or used in the United States of America before my or our invention thereof, or patented or described in any printed publication in any country before my or our invention thereof or more than one year prior to this application, except as follows: _____

_____

That the same was not in public use or on sale in the United States of America more than one year prior to this application, except as follows: _____, that said common subject matter has not been patented or made the subject of an inventor's certificate issued before the date of this application in any country foreign to the United States of America on an application filed by me or my legal representatives or assigns more than twelve months prior to this application, except as follows: _____, that as to applications for patent or inventor's certificate on the common subject matter filed by me or my legal representatives or assigns in any country foreign to the United States of America prior to this application,

☐ no such applications have been filed
☐ such applications have been filed, the filing date and country in which the earliest such application was filed are _____,

and that the filing date and country of filing of every other such foreign application filed more than twelve months prior to the filing of this application are as follows: _____

_____

As to the additional claimed subject matter of this application which is not common to said earlier application, I do not know and do not believe that the same was ever known or used in the United States of America before my or our invention thereof, or patented or described in a printed publication in any country before my or our invention thereof or more than one year prior to this application, or in public use or on sale in the United States of America more than one year prior to the date of this application, and that said subject matter has not been patented or made the subject of an inventor's certificate in any country foreign to the United States of America on an application filed by me or my legal representatives or assigns more than twelve months prior to the date of this application; that as to applications for patent or inventor's certificate on said non-common subject matter filed by me or my legal representatives or assigns in any country foreign to the United States of America prior to this application,

☐ no such applications have been filed
☐ such applications have been filed, the filing date and country in which the earliest such application was filed are _____,

and that the filing date and country of filing of every other such foreign application filed more than twelve months prior to the filing of this application are as follows: _____.

I hereby appoint the following attorney(s) and/or agents to prosecute this application and to transact all business in the Patent and Trademark Office connected therewith:

_____ Telephone No. _____
Address all correspondence to _____
_____
Inventor's full name _____
Inventor's signature _____
Date _____
Residence _____
Citizenship _____
Post Office Address _____
Inventor's full name _____
Inventor's signature _____
Date _____
Residence _____
Citizenship _____
Post Office Address _____
_____

ss:

_____

Sworn to and subscribed before me this _____ day of _____, 19____.

_____
(Signature of notary or officer)

_____
(Official character)

3. Section 3.18a is proposed to be revised to read as follows:

§ 3.18a *Declaration in copending application containing additional subject matter*

(§§ 1.65 and 1.68 provide for a declaration in lieu or in place of an oath in certain instances.)

(This form of declaration may be used with an application disclosing additional subject matter to that disclosed in a prior copending application of the same inventor.)

As a below named inventor, I hereby declare that:

My residence, post office address and citizenship are as stated below next to my name:

I verily believe that I am the original, first and sole inventor (if only one name is listed below) or a joint inventor (if plural inventors are named below) of the invention entitled: _____, described and claimed in the attached specification.

That I acknowledge my duty to disclose information of which I am aware which is material to the examination of this application.

This application discloses subject matter in addition to that disclosed in my or our earlier filed pending application(s). Serial > No. _____, filed _____.

As to the claimed subject matter of this application which is common to said earlier application, I do not know and do not believe that the same was ever known or used in the United States of America before my or our invention thereof, or patented or described in any printed publication in any country before my or our invention thereof or more than one year prior to this application except as follows: _____, that the same was not in public use or on sale in the United States of America more than one year prior to this application, except as follows: _____, that said common subject matter has not been patented or made the subject of an inventor's certificate issued before the date of this application in any country foreign to the United States of America on an application filed by me or my legal representatives or assigns more than twelve months prior to this application, except as follows: _____ that as to applications for patent or inventor's certificate on the common subject matter filed by me or my legal representatives or assigns in any country foreign to the United States of America prior to this application,

☐ no such applications have been filed,
☐ such applications have been filed, the filing date and country in which the earliest such application was filed are _____

and that the filing date and country of filing of every other such foreign application filed more than twelve months prior to the filing of this application are as follows: _____

_____

As to the additional claimed subject matter of this application which is not common to said earlier application, I do not know and do not believe that the same was ever known or used in the United States of America before my or our invention thereof, or patented or described in a printed publication in any country before my or our invention thereof or more than one year prior to this application, or in public use or on sale in the United States of America more than one year prior to the date of this application, and that said subject matter has not been patented or made the subject of an inventor's certificate in any country foreign to the United States of America on an application filed by me or my legal representatives or assigns more than twelve months prior to the date of this application; that as to applications for patent or inventor's certificate on said non-common subject matter filed by me or my legal representatives or assigns in any country foreign to the United States of America prior to this application,

☐ no such applications have been filed,
☐ such applications have been filed, the filing date and country in which the earliest such application was filed are _____,

and that the filing date and country of filing of every other such foreign application filed more than twelve months prior to the filing of this application are as follows: _____

_____

I hereby appoint the following attorney(s) and/or agents to prosecute this application and to transact all business in the Patent and Trademark Office connected therewith: _____ Telephone No._____
Address all correspondence to: _____
_____

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

Inventor's full name _____
Inventor's signature _____
Date _____
Residence _____
Citizenship _____
Post Office Address _____

Inventor's full name _____
Inventor's signature _____
Date _____
Residence _____
Citizenship _____
Post Office Address _____

SIDNEY A. DIAMOND,
Commissioner of Patents and Trademarks.

Jan. 9, 1981.

Approved: Jan. 15, 1981.
FRANCIS W. WOLEK,
Deputy Productivity, Technology and Innovation.
[FR Doc. 81-3256 Filed 1-27-81; 8:45 am]

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21(b)).

Re. 26,956, Re. S.N. 200,224, Filed Oct. 23, 1980, Cl. 215/1 C, MOLECULARLY ORIENTED BOTTLE, Fred E. Wiley, Owner of Record: *Phillips Petroleum Company, Bartlesville, Okla.*, Attorney or Agent: Sidney Neuman, et al., Ex. Gp.: 241

3,062,536, Re. S.N. 175,820, Filed Aug. 6, 1980, Cl. 271/195, SHEET STRIPPING APPARATUS, John Rutkus Jr., et al., Owner of Record: *Xerox Corporation, Rochester, N.Y.*, Attorney or Agent: Harvey M. Brownrout, et al., Ex. Gp.: 313

3,295,306, Re. S.N. 214,584, Filed Dec. 9, 1980, Cl. 57/58.83, DOUBLE TWIST TWISTING PROCESS AND APPARATUS, Karl-Heinz Rehn, Owner of Record: *Barmer Maschinenfabrik Aktienges, Wuppertal-Oberbarmen, Germany,* Attorney or Agent: Charles B. Park III, et al., Ex. Gp.: 244

3,563,286, Re. S.N. 197,111, Filed Oct. 15, 1980, Cl. 83/855, SAW, Keene S. Strobel, et al., Owner of Record: *Weyerhauser Company, Tacoma, Wash.*, Attorney or Agent: Gordon D. Schmidt, et al., Ex. Gp.: 323

3,690,747, Re. S.N. 209,642, Filed Nov. 24, 1980, Cl. 352/87, ANIMATION SYSTEM, Charles A. Vaughn, Owner of Record: *Inventor,* Attorney or Agent: Harold D. Jones, Jr., et al., Ex. Gp.: 211

3,739,691, Re. S.N. 211,419, Filed Nov. 28, 1980, Cl. 91/506, FLUID DEVICE, Wilfred S. Bobier, Owner of Record: *Inventor,* Attorney or Agent: Andrew R. Basile, et al., Ex. Gp.: 343

3,817,609, Re. S.N. 209,641, Filed Nov. 24, 1980, Cl. 352/87, ANIMATION SYSTEM, Charles A. Vaughn, Owner of Record: *Inventor,* Attorney or Agent: Harold D. Jones, Jr., et al., Ex. Gp.: 211

3,846,968, Re. S.N. 224,461, Filed Jan. 12, 1981, Cl. 57/208, YARN STRUCTURE AND METHOD FOR PRODUCING SAME, Richard W. Sheehan, et al., Owner of Record: *Bigelow-Sanford, Inc., Greenville, S.C.*, Attorney or Agent: Paul B. Bell, et al., Ex. Gp.: 244

3,852,416, Re. S.N. 206,941, Filed Nov. 14, 1980, Cl. 424/14, TICK AND FLEA COLLAR OF SOLID SOLUTION PLASTICIZED VINYLIC RESIN-CARBAMATE INSECTICIDE, Larry M. Grubb, et al., Owner of Record: *Thuron Industries, Inc., Dallas, Tex.*, Attorney or Agent: Paul H. Heller, Ex. Gp.: 125

3,872,554, Re. S.N. 205,449, Filed Nov. 3, 1980, Cl. 24/206 B, CLOSURE FOR ARTICLE OF CLOTHING, VALISES, POCKETS OR THE LIKE WITH OVERLAPPING CLOSURE PARTS, Gunther Wolfertz, et al., Owner of Record: *Firma Schaeffer-Homberg GmbH, Wuppertal-Bermen, Germany,* Attorney or Agent: George Gottlieb, et al., Ex. Gp.: 355

3,890,882, Re. S.N. 211,381, Filed Nov. 28, 1980, Cl. 91/487, FLUID DEVICE HAVING PLASTIC HOUSING AND MEANS FOR MOUNTING A CYLINDER BARREL, Wilfred S. Bobier, Owner of Record: *Inventor,* Attorney or Agent: Andrew R. Basile, et al., Ex. Gp.: 343

4,081,940, Re. S.N. 212,135, Filed Nov. 28, 1980, Cl. 52/712, SYSTEM AND APPARATUS FOR INTERCONNECTING STRUCTURAL MEMBERS AND METHOD OF UTILIZING SAME, Robert S. Hughes, Owner of Record: *Oakwood Manufacturing, Inc., Oxford, Mich.*, Attorney or Agent: Irving M. Weiner, et al., Ex. Gp.: 354

4,119,654, Re. S.N. 119,656, Filed Feb. 20, 1980, Cl. 260/429 R, COMPOSITIONS CONTAINING PLATINUM, Martin L. Tobe, et al., Owner of Record: *Rustenberg Platinum Mines Limited, Johannesburg, South Africa,* Attorney or Agent: John W. Malley, et al., Ex. Gp.: 117

4,125,110, Re. S.N. 206,160, Filed Nov. 12, 1980, Cl. 128/641, MONITORING AND STIMULATION ELECTRODE, Alan C. Hymes, Owner of Record: *Lec Tec Corporation, Eden Prairie, Minn.*, Attorney or Agent: Herman H. Bains, et al., Ex. Gp.: 335

4,125,412, Re. S.N. 197,752, Filed Oct. 16, 1980, Cl. 106/300, PROCESS FOR THE PRODUCTION OF DURABLE TITANIUM DIOXIDE PIGMENT, William A. West, Owner of Record: *E. I. Du Pont de Nemours and Company, Wilmington, Del.*, Attorney or Agent: Theodore C. Gregory, Ex. Gp.: 113

4,125,792, Re. S.N. 206,159, Filed Nov. 12, 1980, Cl. 310/268, BRUSHLESS D.C. MOTOR, Fritz Schmider, Owner of Record: *Papst-Motoren KG, Georgen, Germany,* Attorney or Agent: Horst M. Kasper, Ex. Gp.: 212

4,127,308, Re. S.N 210,441, Filed Nov. 25, 1980, Cl. 303/035, FLUID BRAKE CONTROL SYSTEM, Eugene D. McEathron, Owner of Record: *General Signal Corporation, Rochester, N.Y.*, Attorney or Agent: Elliott I. Pollock, et al., Ex. Gp.: 315

4,162,603, Re. S.N. 183,194, Filed Sep. 2, 1980, Cl. 53/438, METHOD AND APPARATUS FOR TRANSFORMING BY PRESSING VOLUMINOUS MATERIAL INTO

BALES, Nils Erik Stromberg, Owner of Record: *Sunds Aktiebolag, Sundsvall, Sweden,* Attorney or Agent: Lawrence I. Lerner, et al., Ex. Gp.: 324

4,176,660, Re. S.N. 210,901, Filed Nov. 28, 1980, Cl. 128/671, DISPOSABLE ESOPHAGEAL AND TRACHEAL MULTI-PROBES, Kenneth C. Mylrea, et al., Owner of Record: *University Patents, Inc., Norwalk, Conn.,* Attorney or Agent: David N. Koffsky, et al., Ex. Gp.: 335

4,209,809, Re. S.N. 210,631, Filed Nov. 26, 1980, Cl. 360/53, APPARATUS AND METHOD FOR RECORD REORIENTATION FOLLOWING ERROR DETECTION IN A DATA STORAGE SUBSYSTEM, Henry K. Chang, et al., Owner of Record: *International Business Machines Corporation, New York, N.Y.,* Attorney or Agent: Henry E. Otto, et al., Ex. Gp.: 235

4,217,601, Re. S.N. 213,537, Filed Dec. 5, 1980, Cl. 357/54, NON-VOLATILE MEMORY DEVICES FABRICATED FROM GRADED OR STEPPED ENERGY BAND GAP INSULATOR MIM OR MIS STRUCTURE, Roger F. DeKeersmaecker, et al., Owner of Record: *International Business Machines Corporation, Armonk, N.Y.,* Attorney or Agent: Hansel L. McGee, et al., Ex. Gp.: 254

PATENT NOTICES

Certificates of Correction for the Week of Mar. 10, 1981

Re. 30,457	4,215,213	4,229,163	4,236,751
D. 256,693	4,215,347	4,229,318	4,236,973
4,000,312	4,215,878	4,229,346	4,237,002
4,067,917	4,216,448	4,229,379	4,237,126
4,087,359	4,217,243	4,229,543	4,237,403
4,093,334	4,217,420	4,230,396	4,237,602
4,102,508	4,217,513	4,230,444	4,237,674
4,119,106	4,217,555	4,230,472	4,237,783
4,143,970	4,217,929	4,230,500	4,238,075
4,153,815	4,218,219	4,231,011	4,238,268
4,162,156	4,218,374	4,231,056	4,238,319
4,162,277	4,218,418	4,231,113	4,238,470
4,167,334	4,218,802	4,231,280	4,238,475
4,172,382	4,220,546	4,231,901	4,238,490
4,172,711	4,221,362	4,233,088	4,238,568
4,175,081	4,221,486	4,233,339	4,238,695
4,180,592	4,221,651	4,233,380	4,238,918
4,181,526	4,221,933	4,233,883	4,239,026
4,182,647	4,221,996	4,233,964	4,239,078
4,183,551	4,222,177	4,233,985	4,239,118
4,186,607	4,222,301	4,234,336	4,239,167
4,188,617	4,223,844	4,234,389	4,239,188
4,189,351	4,224,089	4,234,451	4,239,268
4,189,775	4,224,233	4,234,471	4,239,451
4,190,616	4,224,471	4,234,543	4,239,543
4,191,663	4,224,547	4,234,737	4,239,623
4,196,606	4,224,670	4,234,879	4,239,649
4,198,525	4,225,967	4,235,412	4,239,760
4,200,982	4,226,010	4,235,444	4,239,927
4,201,222	4,226,126	4,235,468	4,239,959
4,204,405	4,226,173	4,235,522	4,240,160
4,204,889	4,226,561	4,235,593	4,240,195
4,205,359	4,227,121	4,235,627	4,240,619
4,206,386	4,227,145	4,235,682	4,240,930
4,208,372	4,227,405	4,235,781	4,241,398
4,209,393	4,227,458	4,235,796	4,241,577
4,210,293	4,227,638	4,235,799	4,241,900
4,210,660	4,227,772	4,235,875	4,242,275
4,212,638	4,228,060	4,236,205	4,242,300
4,212,935	4,228,182	4,236,231	4,242,350
4,213,323	4,228,292	4,236,337	4,242,351
4,213,996	4,228,401	4,236,409	4,242,460
4,214,493	4,228,669	4,236,437	4,243,880
4,214,571	4,228,855	4,236,523	

Dedication

3,681,255.—*John F. Wilfore*, Schenectady, N.Y. PROCESS FOR THE PREPARATION OF LIQUID CALIBRATION FLUIDS. Patent dated Aug. 1, 1972. Dedication filed Oct. 14, 1980, by the assignee, *General Electric Company*.

Hereby dedicates to the Public the remaining term of said patent.

Disclaimers

3,962,846.—*Joseph C. Neitzel*, Sao Paulo, Brazil; *Ronald A. Tomlinson*, Garland; *Allen R. Hurst, Jr.*, Denison, Tex.; *Paul W. Bodovsky* and *Arnold E. Krueger*, Sherman, Tex. APPARATUS FOR AUTOMATIC WRAPPING OF BALES. Patent dated June 15, 1976. Disclaimer filed Nov. 24, 1980, by the assignee, *Continental Conveyor and Equipment Company, Inc.*

Hereby enters this disclaimer to claims 1 through 20 of said patent.

4,201,779.—*Dieter Bormann* and *Bernd Knabe*, Kelkheim; *Elmar Schrinner* and *Manfred Worm*, Wiesbaden, all of Fed. Rep. of Germany. 7[(2-AMINO-THIAZOL-4-YL) GLYOXYLAMIDO]-CEPHEM DERIVATIES AND PROCESSES FOR THEIR PREPARATION. Patent dated May 6, 1980. Disclaimer filed Dec. 22, 1980, by the assignee, *Hoechst Aktiengesellschaft*.

Hereby enters this disclaimer to claims 1, 2, 3, 4, and 5 of said patent.

4,242,575.—*John A. Callahan*, Houston and *Allan S. Ottenstein*, Spring, Tex. GASOLINE PUMP DIGITAL PRICE ENCODER. Patent dated Dec. 30, 1980. Disclaimer filed Apr. 21, 1980, by the assignee, *RF Products Corp.*

The term of this patent subsequent to July 11, 1995, has been disclaimed.

National Technical Information Service

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DOUGLAS J. CAMPION,
Program Coordinator,
Office of Government Inventions and Patents,
National Technical Information Service,
U.S. Department of Commerce.

DEPARTMENT OF THE ARMY, OTJAG

Chief, Intellectual Property Division, Room 2D 444, Pentagon, Washington, D.C. 20310

Patent application 6-087,114. Induction Heating or Ion Plating Induction Heating Calcium Chemical Pump. Filed Oct. 22, 1979.

Patent application 6-108,195. Bi-Orthogonal PCM Communications System Employing Multiplexed Noise Codes. Filed Dec. 28, 1979.

Patent application 6-126,516. Frequency Agility Technique for Frequency Scanned Antenna. Filed Mar. 3, 1980.

Patent application 6-134,858. Video Tracker. Filed Mar. 28, 1980.

Patent application 6-137,651. Direct Conversion Analog to Digital Converter. Filed Apr. 7, 1980.

Patent application 6-138,055. Capillary Waveguide Laser With Cooled Porous Walls. Filed Apr. 7, 1980.

Patent application 6-140,345. Traveling-Wave Tube Utilizing Vacuum Housing as an RF Circuit. Filed Apr. 14, 1980.

Patent application 6-142,917. Small Broadband Antennas Using Lossy Matching Networks. Filed Apr. 23, 1980.

Patent application 6-145,180. Resonator Configurations for Severe Environments. Filed Apr. 30. 1980.

Patent application 6-146,560. Phase Shifter and Line Scanner for Phased Array Applications. Filed May 5, 1980.

Patent application 6–146,804. Matched High Q, High Frequency Resonators. Filed May 5, 1980.

Patent application 6–147,778. Method of Chemically Polishing a Doubly Rotated Quartz Plate. Filed May 8, 1980.

Patent application 6–148,428. Nuclear Activated CW Chemical Laser. Filed May 9, 1980.

Patent application 6–148,636. Isolation Transformer. Filed May 12, 1980.

Patent application 6–149,204. Bonded Grid-Cathode Electrode Structure. Filed May 12, 1980.

Patent application 6–150,765. Optical Fiber Dispenser. Filed May 19, 1980.

Patent application 6–153,299. Millimeter-Wave Dielectric Waveguide Power Limiter for Self-Oscillating Mixer. Filed May 27, 1980.

Patent application 6–155,347. A Power Measuring Device for Pulsed Lasers. Filed June 2, 1980.

Patent application 6–159,730. Noise Reduction in Engine Exhaust. Filed June 16, 1980.

Patent 4,187,300. Use of Phosphonium Salts in Treatment of African Trypanosomiasis. Filed Dec. 20, 1978. Patented Feb. 5, 1980. Not available NTIS.

Patent 4,209,510. Ammonia-Cyanoborane, Sodium Iodide Complex. Filed Nov. 14, 1978. Patented June 24, 1980. Not available NTIS.

Patent 4,209,519. Anti-Leishmanial Lepidine Derivatives. Filed Mar. 13, 1978. Patented June 24, 1980. Not available NTIS.

Patent 4,210,099. Floating Receptacle for Collecting Histologic Material. Filed Jan. 19, 1979 Patented July 1, 1980. Not available NTIS.

Patent 4,214,272. Video Highlight Attenuation Processor. Filed Apr. 17, 1979. Patented July 22, 1980.

U.S. DEPARTMENT OF THE AIR FORCE

AF/JACP, 1900 Half St., SW., Washington, D.C. 20324

Patent application 6–128,345. Wide Range Multiple Time Mark Generator. Filed Mar. 7, 1980.

Patent application 6–160,260. Multilayer Extender Board. Filed June 17, 1980.

Patent application 6–162,555. Optical Fringe Analysis. Filed June 24, 1980.

Patent application 6–169,056. Electrostatic Free Electron Laser. Filed July 15, 1980.

Patent application 6–169,231. Signal Compressor Apparatus. Filed July 15, 1980.

Patent application 6–171,612. Digital Voice Conferencing Apparatus in Time Division Multiplex Systems. Filed July 23, 1980.

Patent application 6–171,614. Coherent Optical Feature Identifier Apparatus. Filed July 23, 1980.

Patent application 6–171,913. Programmable Synchronous Digital Delay Line. Filed July 23, 1980.

Patent application 915,709. Backlash Filter Apparatus. Filed June 15, 1978.

Patent 4,215,712. Ready Pressure Attachment for Existing Anti-G Valves. Filed Dec. 5, 1978. Patented Aug. 5, 1980. Not available NTIS.

Patent 4,217,026. Elliptic Cylindrical Baffle Assembly. Filed Aug. 25, 1978. Patented Aug. 12, 1980. Not available NTIS.

Patent 4,219,039. Multivariable Anti-G Valve. Filed Oct. 6, 1978. Patented Aug. 26, 1980. Not available NTIS.

Patent 4,220,933. Baffle/Nozzle Array for Cylindrical Lasers. Filed July 20, 1978. Patented Sept. 2, 1980. Not available NTIS.

Patent 4,224,548. Singly Rotated Cut of Y-Axis Boule Lead Potassium Niobate, Pb2KNb5015, for Surface Acoustic Wave Applications. Filed May 31, 1979. Patented Sept. 23, 1980. Not available NTIS.

Patent 4,224,549. Lead Potassium Niobate Substrate Member for Surface Acoustic Wave Applications. Filed May 31, 1979. Patented Sept. 23, 1980. Not available NTIS.

U.S. DEPARTMENT OF AGRICULTURE

Program Agreements and Patent Branch Administration Service Division, Federal Bldg., Science and Education Administration, Hyattsville, Md. 20782

Patent 4,219,964. Rope Wick Applicator. Filed Dec. 13, 1978. Patented Sept. 2, 1980. Not available NTIS.

U.S. DEPARTMENT OF ENERGY

Assistant General Counsel for Patents, Washington, D.C. 20545

Patent application 6–100,754. Preparation and Uses of Amorphous Boron Carbide Coated Substrates. Filed Dec. 5, 1979.

Patent application 6–101,363. Method for Preparing Corrosion-Resistant Ceramic Shapes. Filed Dec. 7, 1979.

Patent application 6–105,338. Annealed CVD Molybdenum Thin Film Surface. Filed Dec. 19, 1979.

Patent application 6–105,439. Superconducting Wire With Improved Strain Characteristics. Filed Dec. 19, 1979.

Patent application 6–108,199. Method Using Laser Irradiation for the Production of Atomically Clean Crystalline Silicon and Germanium Surfaces. Filed Dec. 28, 1979.

Patent 4,209,375. Sputter Target. Filed Aug. 2, 1979. Patented June 24, 1980. Not available NTIS.

U.S. DEPARTMENT OF TRANSPORTATION

Patent Counsel, 400 7th St., SW., Washington, D.C. 20590

Patent application 6–198,537. Public-Access Information System Terminal. Filed Oct. 20, 1980.

Patent application 6–203,556. Digital Air Brake Control System. Filed Nov. 5, 1980.

U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES

National Institutes of Health, Chief, Patents Branch, Westwood Bldg., Bethesda, Md. 20205

Patent 4,220,725. Capillary Cell Culture Device. Filed Apr. 3, 1978. Patented Sept. 2, 1980. Not available NTIS.

Patent 4,228,009. Toroidal Coil Planet Centrifuge. Filed June 4, 1979. Patented Oct. 14, 1980. Not available NTIS.

U.S. DEPARTMENT OF THE NAVY

Director, Navy Patent Program/Patent Counsel for the Navy, Office of Naval Research, Code 302, Arlington, Va. 22217

Patent application 6–147,815. Method of Rendering Nitrile Elastomer Surfaces Receptive for Bonding by Epoxy Adhesives. Filed May 8, 1980.

Patent application 6–185,047. Linear Motion and Pop-Up Target Training System. Filed Sept. 8, 1980.

Patent application 6–185,702. Method of Manufacturing a Field-Emission Cathode Structure. Filed Sept. 10, 1980.

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

Assistant General Counsel for Patent Matters—NASA Code GP–2, Washington, D.C. 20546

Patent application 6–182,879. Crystal Cleaving Machine. Filed Aug. 29, 1980.

Patent 4,216,186. Means for Growing Ribbon Crystals Without Subjecting the Crystals to Thermal Shock-Induced Strains. Filed Aug. 31, 1978. Patented Aug. 5, 1980. Not available NTIS.

Patent 4,217,165. Method of Growing a Ribbon Crystal Particularly Suited for Facilitating Automated Control of Ribbon Width. Filed Apr. 28, 1978. Patented Aug. 12, 1980. Not available NTIS.

Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries

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These patent collections are open to public use and each of the patent depository libraries, in addition, offers the publications of the patent classification system (e.g. The Manual of Classification, Index to the U.S. Patent Classification, Classification Definitions, etc.) and provides technical staff assistance in their use to aid the public in gaining effective access to information contained in patents. With one exception, as noted in the table following, the collections are organized in patent number sequence.

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	Sunnyvale: Patent Information Clearinghouse*	(408) 738-5580
Colorado	Denver Public Library	(303) 573-5152 Ext. 223
Delaware	Newark: University of Delaware	(302) 738-2238
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	St. Louis Public Library	(314) 241-2288 Ext. 214
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	New York Public Library (The Research Libraries)	(212) 790-6291
North Carolina	Raleigh: D. H. Hill Library, N.C. State University	(919) 737-3280
Ohio	Public Library of Cincinnati & Hamilton County	(513) 369-6936
	Cleveland Public Library	(216) 623-2932
	Columbus: Ohio State University Libraries	(614) 422-6286
	Toledo/Lucas County Public Library	(419) 255-7055 Ext. 212
Oklahoma	Stillwater: Oklahoma State University Library	(405) 624-6546
Pennsylvania	Philadelphia: Franklin Institute Library	(215) 448-1224**
	Pittsburgh: Carnegie Library of Pittsburgh	(412) 622-3138
	University Park: Pattee Library, Pennsylvania State University	(814) 865-4861
Rhode Island	Providence Public Library	(401) 521-7722 Ext. 224
Tennessee	Memphis & Shelby County Public Library and Information Center	(901) 528-2957
Texas	Dallas Public Library	(214) 748-9071
	Houston: The Fondren Library, Rice University	(713) 527-8101 Ext. 2587
Washington	Seattle: Engineering Library, University of Washington	(206) 543-0740
Wisconsin	Madison: Kurt F. Wendt Engineering Library, University of Wisconsin	(608) 262-6845
	Milwaukee Public Library	(414) 278-3043

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PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

WILLIAM FELDMAN, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF NOVEMBER 29, 1980

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—D. E. TALBERT, Director Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metallurgical Apparatus; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	11-23-79
GENERAL ORGANIC CHEMISTRY, GROUP 120—C. E. VAN HORN, Director Heterocyclic Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	10-10-79
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—J. O. THOMAS, JR., Director Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g., Coating; Molding; Ink; Prosthodontics; Adhesive and Abrading Compositions; Molding, Shaping, Treating Process, and Apparatus Therefor; Irradiation (Part); Bleaching; Dyeing; Leather, Fur and Textile Treating Compositions.	9-11-79
COATING, LAMINATING AND PHOTOGRAPHY, GROUP 160—S. N. ZAHARNA, Director Coating: Processes, Apparatus and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; and Photography.	12-12-79
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—R. F. WHITE, Director Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	12-5-79
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—Vacant Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Horology; Acoustics; Recorders; Weighing Scales.	1-8-79
SPECIAL LAWS ADMINISTRATION, GROUP 220—Vacant Ordnance, Firearms and Ammunition; Lubrication; Illumination; Nuclear Reactors; Acoustics, Communications, Optics; Radar; Directional Radio; Torpedoes; Seismic Exploring; Cathode Ray Tube Circuitry; Cryptography; Laser Devices; Radioactive Materials; Powder Metallurgy; Rocket Fuels; Special, Fuel, Explosive and Thermic Compositions; Thermal and Photoelectric Batteries.	7-2-79
INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—Vacant Communications; Multiplexing Techniques; Television; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	10-9-79
RECEPTACLES, SANITATION AND CLEANING, WINDING, AND MEASURING, GROUP 240—A. L. SMITH, Director Receptacles; Bearings; Joint Packing; Conduits; Switches; Presses; Plumbing Fixtures; Textile Spinning; Cleaning; Food Treating; Agitating; Centrifugal Separating; Geometrical Instruments; Sound Recording; Image Projectors; Web Feeding; Winding and Reeling; Cable Hoists; Measuring and Testing; Indicating; Fluent Material Handling.	1-22-79
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—S. S. MATTHEWS, Director Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	12-21-78
DESIGNS, GROUP 290—Vacant Industrial Arts; Household, Personal and Fine Arts.	1-8-79
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—B. R. GRAY, Director Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	8-18-79
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—M. M. NEWMAN, Director Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion-Bonding, Metal Founding; Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks; Fishing, Etc.; Butchering; and Books and Printed Matter.	7-20-79
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—R. E. AEGERTER, Director Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Plants; Harvesting; Earth Working and Excavating; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Information Dissemination.	8-1-79
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—D. J. STOCKING, Director Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Couplings; Gearing; Fluid Handling and Control; Lubrication.	6-1-79
GENERAL CONSTRUCTIONS, TEXTILES, MINING AND GEARING, GROUP 350—G. M. FORLENZA, Director Building Structures; Racks; Cabinets; Closures; Supports; Furniture; Fasteners; Locks; Pipe Couplings; Joints; Misc. Hardware; Textiles; Sewing Machines; Apparel; Footwear; Earth Engineering; Earth Drilling; Mining; Wells; Roads; Bridges; Tool Driving; Gearing; Machine Elements; Clutches.	3-19-79

Expiration of patents: The patents within the range of numbers indicated below expire during November 1980, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents ..... Numbers 3,109,176 to 3,112,486, inclusive
Plant Patents ..... Numbers 2,295 to 2,323, inclusive

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 30,539

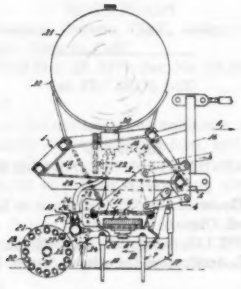
SOIL CULTIVATING IMPLEMENTS

Cornelis van der Lely, 7, Bruschenrain, Zug, Switzerland

Original No. 4,023,507, dated May 17, 1977, Ser. No. 601,098, Aug. 1, 1975. Application for reissue Nov. 7, 1978, Ser. No. 958,567

Int. Cl.³ A01C *23/02*

U.S. Cl. 111—6 **31 Claims**



28. In an agricultural implement, including at least one soil working tool and a spraying system, said system comprising a container for agricultural fluid material to be sprayed and at least one nozzle positioned to spray fluid in the path of soil worked by the soil working means, said nozzle being adapted to spray a fan-shaped pattern of material and said tool being located in advance of said nozzle, monitoring means comprising an electric circuit with electrical conductor means in switching communication with indication means, said conductor means including at least one exposed wire the end of which defines a gap in the circuit, said wire end being located below and substantially to one side of a vertical plane that passes through said nozzle and in the spray pattern that discharges from said nozzle, whereby, during normal operation, spray is spread across said gap to close said circuit and said indication means is actuated.

Re. 30,540

HEAT STORAGE WATER TANK

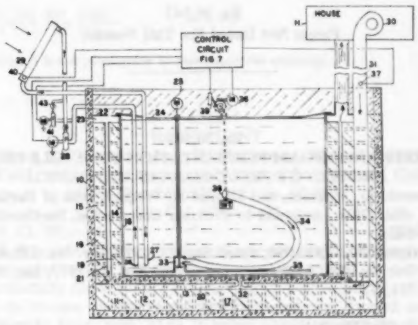
Floyd A. Lyon, Brookville, N.Y., and Henry Harrison, deceased, late of Locust Valley, N.Y. (by Dorothy D. Harrison, administratrix), assignors to Halm Instrument Co., Inc., Glen Head, N.Y.

Original No. 4,108,374, dated Aug. 22, 1978, Ser. No. 709,587, Jul. 29, 1976. Application for reissue Nov. 20, 1978, Ser. No. 962,143

Int. Cl.³ F24D *11/00*

U.S. Cl. 126—421 **11 Claims**

7. In a liquid filled heat storage tank, a heat exchanger, means movable in height connected inside the tank and connected to the heat exchanger for drawing liquid from a controllable height within said tank, passing said liquid through said heat exchanger for delivering heat to use, and means connected to the liquid drawing means for returning said liquid to said heat storage tank at the bottom of said tank,



whereby the temperature of said heat exchanger is kept substantially equal to the temperature of said liquid at said controllable height.

Re. 30,541

THERMOPLASTIC SPLINT OR CAST

Lester M. Larson, 4619 Bailey Dr., Wilmington, Del. 19808

Original No. 3,853,124, dated Dec. 10, 1974, Ser. No. 305,914, Nov. 13, 1972. Continuation-in-part of Ser. No. 3,474, Jan. 16, 1970, Pat. No. 3,809,600, which is a continuation-in-part of Ser. No. 683,016, Nov. 4, 1967, Pat. No. 3,490,444. Application for reissue Nov. 12, 1976, Ser. No. 741,521

The portion of the term of this patent subsequent to Jan. 20, 1987, has been disclaimed.

Int. Cl.³ A61F *5/04*

U.S. Cl. 128—90 **6 Claims**

1. A process of forming a body supporting member such as a cast, splint or the like, comprising warming a sheet of crystalline thermoplastic polymer having a thickness in the range of about 2 to 200 mils, to a temperature in the range of about 60° to 110° C. for a heat softening period sufficient to convert the total crystalline substance to a softened, amorphous form, said heat-softened sheet of polymer developing a hysteresis to have a setting time substantially delayed to remain soft and amorphous below the crystalline setting temperature, whereby it may be cooled to a comfortable body temperature below about 40° C., whereby the sheet may be formed and shaped for use as a body supporting cast or splint, [said sheet having at least its surface adjacent to the body member to be protected deformed to include surface irregularities capable of absorbing and interrupting continuous moisture films that may be developed upon the body member to be protected, said surface irregularities consisting of cup-like depressions, knurled depressions, texturing, foam and close spaced perforations which are evenly distributed throughout the surface of the said plastic and the like,] cutting said softened sheet to dimensional size and manually shaping, wrapping and forming said sheet [upon] *at a*

comfortable body temperature in the form of the body member to be supported [and protected at said comfortable body temperature with the surface irregularities disposed adjacent to the body member enclosed,] and maintaining the entire supported assembly substantially immobile until the sheet sets by crystallization to a rigid body support.

Re. 30,542
Patent Not Issued For This Number

Re. 30,543
METHANOL FOAM FERMENTATION TO SINGLE CELL PROTEIN BY *PSEUDOMONAS METHANICA*

Donald O. Hitzman, and Eugene H. Wegner, both of Bartlesville, Okla., assignors to Provesta Corporation, Bartlesville, Okla.

Original No. 3,982,998, dated Sep. 28, 1976, Ser. No. 530,422, Dec. 6, 1974. Application for reissue Jan. 21, 1977, Ser. No. 761,171

Int. Cl.[3] C12N *1/34, 1/20*

U.S. Cl. 435—246 **2 Claims**

17. A process for production of microbial cells in a fermentation vessel having a draft tube positioned therein with a first flow path portion through said draft tube and a second flow portion between the draft tube and a portion of the vessel, said process including the steps of:

(a) placing a microorganism into a fermenter vessel containing an aqueous nutrient medium and aerobically culturing said microorganism, said microorganism being capable of assimilating alcohol as a main source of carbon;

(b) introducing oxygen into the fermenter;

(c) introducing at least one alcohol selected from the group consisting of methanol and ethanol into the fermenter vessel as the main carbon source for said microorganism to assimilate and produce microbial cells;

(d) maintaining said alcohol and medium in a foamed condition in said fermenter vessel so that said fermenter vessel is essentially foam-filled;

(e) continuously circulating the foamed alcohol and medium through the first flow path portion to the second flow path portion and then back to the first flow path portion within the fermenter in loop flow; and

(f) separating and recovering the microbial cells produced in said fermenter vessel;

wherein said microorganism is Pseudomonas methanica.

Re. 30,544
Patent Not Issued For This Number

Re. 30,545
CATALYST

Sargis Khoobiar, Kinnelon, N.J., assignor to Halcon Research and Development Corporation, New York, N.Y.

Original No. 4,087,382, dated May 2, 1978, Ser. No. 744,657, Nov. 24, 1976. Application for reissue Oct. 18, 1979, Ser. No. 86,224

Int. Cl.[3] B01J *21/00, 23/08, 23/28*

U.S. Cl. 252—455 R **2 Claims**

1. A catalyst composition suitable for the vapor-phase oxidation of an olefin to produce the corresponding unsaturated aldehyde with high selectivity comprising oxides of molybdenum, cobalt, iron, bismuth, thallium, [and] antimony, and [optionally] silicon.

Re. 30,546
FUNCTION INDICATION MEANS FOR ELECTRIC SWITCHES

Earl T. Piber, Oconomowoc, Wis., assignor to Eaton Corporation, Cleveland, Ohio

Original No. 3,995,132, dated Nov. 30, 1976, Ser. No. 604,786, Aug. 14, 1975. Application for reissue Apr. 6, 1978, Ser. No. 893,887

Int. Cl.[2] H01H *9/16*

U.S. Cl. 200—308 **5 Claims**

15. In a rocker switch, the combination comprising:

a housing;

rocker operator means pivotally mounted to said housing for effecting switching operations, said rocker operator means having an external rocker portion having a window formed therein and a thin passageway formed therethrough generally along an inner perimeter thereof and passing beneath said window;

a sheet-like elongated laterally flexible ribbon deflectably and slidably extending longitudinally through said passageway and confined by said passageway to emerge downwardly in substantially parallel lower end sections spaced on opposite sides of the pivotal axis of said rocker operator means, said lower end sections extending a short distance and having bottom edges freely abutting said housing, said ribbon being sufficiently rigid to prevent buckling of said lower end sections upon pivoting of said rocker operator means such that part of one of said lower end sections enters said passageway and the bottom edge of the other of said lower end sections remains in substantial abutment with said housing and said ribbon effectively slides through said passageway deflectably conforming to the shape thereof to expose a different segment of said ribbon through said window.

PLANT PATENTS

GRANTED MARCH 10, 1981

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

4,663
ROSE PLANT

Jack E. Christensen, Ontario, Calif., assignor to Armstrong Nurseries, Inc., Ontario, Calif.

Filed Oct. 29, 1979, Ser. No. 89,201
Int. Cl.[3] A01H *5/00*
U.S. Cl. Plt.—7 **1 Claim**

1. A new and distinct variety of miniature rose plant, substantially as herein shown and described, and being particularly characterized in that the plant has a vigorous, tall and very upright habit of growth, with strong stems which may bear up to four or more flowers, the overall color effect, both in bud and in flower, being deep orange, the blooms being large for roses of this class, ranging from 1.0 to 1.5 inches in diameter, and comprising from 15 to 20 round to broadly obovate petals.

4,664
ROSE PLANT

Jack E. Christensen, Ontario, Calif., assignor to Armstrong Nurseries, Inc., Ontario, Calif.

Filed Oct. 24, 1979, Ser. No. 87,809
Int. Cl.[3] A01H *5/00*
U.S. Cl. Plt.—8 **1 Claim**

1. A new and distinct variety of rose plant of the hybrid miniature class, substantially as herein shown and described, and being further characterized in the well-formed golden yellow buds and blooms, the double petalage of which displays substantially the same coloration in outer, intermediate and inner petals and on the inner and outer surfaces of each petal, the bush being of upright and vigorous growth habit and profusely producing flowers of heavy substance and good color retention.

4,665
ROSE PLANT NAMED CHANTILLY LACE

Paul F. De Vor, deceased, late of Pleasanton, Calif. (by Thelma G. De Vor, executor), assignor to De Vor Nurseries, Inc., Pleasanton, Calif.

Filed Jul. 2, 1979, Ser. No. 53,932
Int. Cl.[3] A01H *5/00*
U.S. Cl. Plt.—11 **1 Claim**

1. A new and distinct variety of rose plant substantially as herein shown and described, characterized by its high-centered lavender colored blooms and very strong fragrance. This new variety has a vigorous and free growing habit of growth and a profuse year-around production of long stemmed, long lasting flowers.

4,666
ROSE PLANT

Herbert C. Swim, and Jack E. Christensen, both of Ontario, Calif., assignors to Armstrong Nurseries, Inc., Ontario, Calif.

Filed Oct. 24, 1979, Ser. No. 87,804
Int. Cl.[3] A01H *5/00*
U.S. Cl. Plt.—24 **1 Claim**

1. A new and distinct variety of rose plant of the floribunda class, substantially as herein shown and described, and being particularly characterized by the brilliant golden yellow color of its blooms, the buds and flowers being well-formed and relatively large, with 20 to 26 broad round petals, blooming profusely substantially throughout the growing season.

4,667
CARNATION PLANT

Walter H. Jessel, Jr., Fremont, and William E. Duffett, Salinas, both of Calif., assignors to Yoder Brothers, Inc., Barberton, Ohio

Filed Oct. 31, 1979, Ser. No. 89,730
Int. Cl.[3] A01H *5/00*
U.S. Cl. Plt.—70 **1 Claim**

1. A new and distinct cultivar of *Dianthus caryophyllus,* L., known by the cultivar name Ace, as described and illustrated, and particularly characterized as to uniqueness by the combined characteristics of commercial double flower type; flat flower form, reflexing slightly at maturity; medium flower size, ranging from 45 to 65 mm. in diameter; light orange flower color with scarlet red picotee color pattern, faintly striped; medium flowering response; 6 to 8 flowers and buds showing color per flowering stem; medium peduncle length, ranging from 10 to 12 cm.; strong peduncle strength; and tall plant height.

4,668
CARNATION PLANT

Walter H. Jessel, Jr., Fremont, and William E. Duffett, Salinas, both of Calif., assignors to Yoder Brothers, Inc., Barberton, Ohio

Filed Oct. 31, 1979, Ser. No. 89,729
Int. Cl.[3] A01H *5/00*
U.S. Cl. Plt.—71 **1 Claim**

1. A new and distinct cultivar of *Dianthus caryophyllus,* L. known by the cultivar name Queen, as described and illustrated, and particularly characterized as to uniqueness by the combined characteristics of commercial double flower type; flat flower form, twisting slightly with maturity; medium flower size, light salmon pink flower color with minimum color oxidation; medium flowering response; 4 to 7 flowers and buds showing color per flowering stem; medium peduncle length; strong peduncle strength; and tall plant height.

PATENTS

GRANTED MAR. 10, 1981

ERRATA

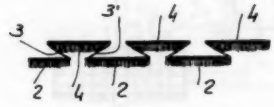
For CLASS	See PATENT NO.
434–267	4,254,562
474–253	4,254,666
493–179	4,254,692
493–060	4,254,693
411–167	4,254,809
227–050	4,254,895
369–041	4,254,959
136–249	4,255,211
556–410	4,255,348
564–305	4,255,354
564–305	4,255,355
564–499	4,255,356
564–480	4,255,357
568–931	4,255,358
570–243	4,255,359
424–311	4,255,405
423–365	4,255,453
526–225	4,255,567
365–155	4,255,674

PATENTS

GRANTED MARCH 10, 1981

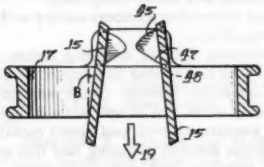
GENERAL AND MECHANICAL

4,254,507
VERTICAL STRIP FURRIERY ARTICLE
Paolo Aimett, Via Pietro Verri, 10, 20121 Milano, Italy
Filed Mar. 5, 1979, Ser. No. 17,460
Claims priority, application Italy, Nov. 15, 1978, 29831 A/78
Int. Cl.³ A41D *5/00*
U.S. Cl. 2—65 **6 Claims**



1. A pleated fur article consisting of a plurality of vertical strips of fur, each one of said fur strips, alternatively connected with strips of cloth or shammy leather, the strips of cloth or shammy leather being folded back under the fur strips to form the pleats.

4,254,508
BILEAFLET HEART VALVE WITH IMPROVED PIVOT
Jack C. Bokros, Alpine, Calif., assignor to Carbomedics, Inc., San Diego, Calif.
Continuation-in-part of Ser. No. 894,166, Apr. 6, 1978, Pat. No. 4,178,639. This application Jul. 30, 1979, Ser. No. 61,660
Int. Cl.³ A61F *1/22*
U.S. Cl. 3—1.5 **8 Claims**



1. A heart valve prosthesis comprising an annular valve body having a central passageway extending therethrough,

a pair of valve leaflets,

means supporting said pair of leaflets for substantially pivotal movement on a pair of eccentric axes between a closed position blocking blood flow through said central passageway and an open position allowing blood flow therethrough,

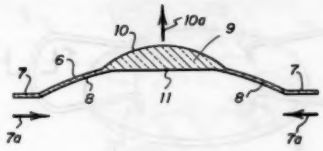
wherein the improvement comprises,

said leaflets each including guides projecting in opposite directions along the pivotal axis, said guides having a rounded bottom end,

said support means including pairs of generally triangular depressions at generally diametrically opposite locations,

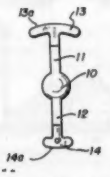
each of said depressions having a curved top edge and generally straight outer and inner edges which meet at a vertex, said leaflet guides being received in said depressions with said bottom ends at the vertex thereof, said vertex being formed with a radius of curvature matched to the radius of curvature of said bottom ends and providing pivot points for each bottom end, whereby said leaflets each move between an open position wherein said guides are located generally adjacent said outer edges and a closed position wherein said guides are located generally adjacent said inner edges.

4,254,509
ACCOMMODATING INTRAOCULAR IMPLANT
Jerald L. Tennant, 806 Greentree Ct., Duncanville, Tex. 75116
Filed Apr. 9, 1979, Ser. No. 28,609
Int. Cl.³ A61F *1/16*
U.S. Cl. 3—13 **4 Claims**



1. In an eye implant having an optical lens anteriorly convex and posteriorly planar supported on two diametrically opposed coplanar feet through two supporting members forming a substantially continuous arched surface, each supporting member being unitary with said lens and rooted in one of said feet outside the perimeter of said lens and supporting said lens with the posterior thereof anterior to the plane of said feet, the improvement comprising said lens being formed of a rigidly biologically inert material, and said supporting members being formed of soft biologically supporting hydrogel material to provide structure which, when fixed into the eye, moves said lens anteriorly only along the axis of the eye when forces are applied to said feet upon contraction of the ciliary body.

4,254,510
IMPLANT LENS WITH BIARCUATE FIXATION
Jerald L. Tennant, 806 Greentree Ct., Duncanville, Tex. 75137
Filed Jun. 18, 1979, Ser. No. 49,551
Int. Cl.³ A61F *1/16, 1/24*
U.S. Cl. 3—13 **12 Claims**



1. An intraocular implant unit for permanent installation and immobilization in a circularly bounded chamber in the eye of a patient comprising:

(a) a lens;

(b) a first limb and a second limb integral with and extending outward radially from opposite margins of said lens;

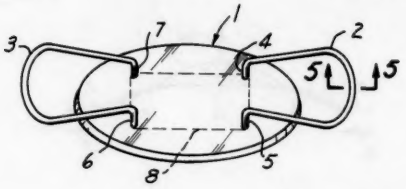
(c) a long arcuate rim mounted at its center on the end of said first limb; and

(d) a short arcuate rim defining an arcuate length of less extent than said long arcuate rim and being mounted at its center on the end of said second limb, wherein said rims conform to a circle having a diameter equal to the diameter of the circularly bounded chamber and wherein said rims have the same center of curvature.

4,254,511
INTRAOCULAR LENS WITH NONCIRCULAR EYE ENGAGING RETENTION MEANS

Charles P. Chase, Brea, and William J. Link, Irvine, both of Calif., assignors to Heyer-Schulte Corporation, Goleta, Calif.

Filed Jul. 25, 1979, Ser. No. 60,530
Int. Cl.[3] A61F *1/16, 1/24*
U.S. Cl. 3—13 8 Claims

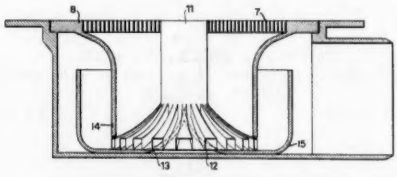


1. An intraocular lens comprising: an optical section of a first material, which optical section has opposed faces extending between a peripheral edge; a rod-like retaining member of a different second material, which rod-like retaining member is free of attachment with the optical section's peripheral edge and has an integral shank with at least one end attached at a specific location to the optical section spaced inwardly from said peripheral edge; and this shank has a noncircular cross section with a flattened area oriented in a particular direction so as to engage an inner edge of an iris when the intraocular lens is surgically implanted in an eye.

4,254,512
WATER TRAP

Gert Söderström, 62 Hammarbyvägen, Upplands Väsby, Sweden (S-194 00)

Filed Dec. 21, 1978, Ser. No. 971,747
Claims priority, application Switzerland, Dec. 22, 1977, 14652/77
Int. Cl.[3] E03C *1/22, 1/284, 1/29;* E03F *5/04*
U.S. Cl. 4—191 2 Claims

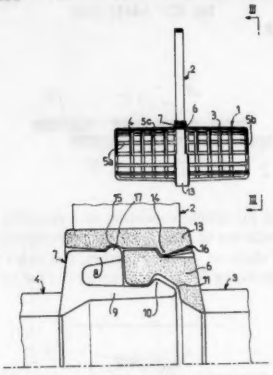


1. A water trap for use in sinks and other drains comprising:
an upper tubular drain member having an upper inlet and a lower edge defining an outlet;
a lower cup-shaped member having a closed bottom and an upper overflow edge, said lower member surrounding a lower portion of said upper member with said lower edge disposed between said bottom and said overflow edge to define an annular gap between said members; and
an auxiliary drain pipe disposed concentrically within and occupying a portion of said upper member, said auxiliary drain pipe extending from said inlet to below said lower edge to define two separate fluid flow paths from said inlet to said annular gap, and having a corrugated bottom portion which flares outwardly to below said lower edge to define alternating channels of said two flow paths.

4,254,513
DEODORANT-PRODUCT HOLDER FOR A LAVATORY PAN

Bertrand Cretin, Tours, and Andre M. Godefroy, Neuille-Pont-Pierre, both of France, assignors to Chiminter, Tours, France

Filed Jun. 11, 1979, Ser. No. 47,209
Claims priority, application France, Jun. 27, 1978, 78 19181
Int. Cl.[3] A47K *17/00;* A61L *3/00;* B01J *4/00;* E03D *9/02*
U.S. Cl. 4—231 4 Claims



1. A holder assembly for a solid deodorant product comprising,
a first perforated cage section,
a second perforated cage section; and
means for connecting said cage sections together in end to end relation to provide a perforated cage for a solid deodorant product, said means comprising:
first and second connection members unitary with said cage sections, respectively,
said first connection member including detent means for engagement with said second connection member,
said second connection member comprising circumferentially extending skirts, one of said skirts including means for snap-fit engagement with said detent means, and
a third connection member engaging said first and second connection members and including means extending thereabout for positively interconnecting said first connection member with said second connection member,
and in which said first connection member detent means are disposed at radially inner and outer locations and said third connection member interconnecting means are disposed axially spaced from one another.

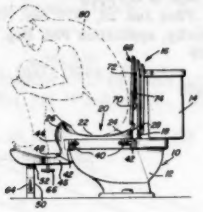
4,254,514
ATTACHABLE TOILET BOWL SEAT AND FOOTREST

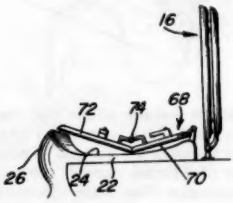
Minoru Sakamoto, 3911 Nioi Pl., Honolulu, Hi. 96816

Filed Feb. 6, 1980, Ser. No. 119,362
Int. Cl.[3] A47K *13/00*
U.S. Cl. 4—234 12 Claims

1. A toilet bowl assembly including an open seat member for use when seated during a bowel movement, said seat member defining an upper seat surface at least substantially encircling a vertical central opening extending through and defined by said seat member, said seat member including front, rear and opposite sides portions, said upper seat surface being upwardly concave in a front-to-rear extending direction, a cover, said cover including first and second sections pivotally joined together along adjacent marginal portions, the marginal portions of said first section opposite from said second section being pivotally supported relative to said seat member adjacent the rear portion thereof for swinging of said cover relative to the seat member between a raised upstanding position adjacent

the rear portion of said seat member and a lowered horizontal position overlying and closing said seat member from above, said cover first and second sections being relatively angularly displaceable between coextensive generally coplanar positions to be assumed when the cover is disposed in the raised upstanding position thereof and relatively angulated positions with said first and second sections each inclined downwardly toward said adjacent marginal portions for fitting more closely over the upwardly concave upper surface of said seat member when said cover is disposed in the lowered horizontal position.





4,254,515

COMPOST-TYPE TOILET EQUIPMENT

Torao Kiyama, 8764-66, Shimofukumoto-cho, and Satoshi Kiyama, 12-3, 2-chome, Minamisakae, both of Kagoshima-City, Japan

Filed Nov. 5, 1979, Ser. No. 91,557
Claims priority, application Japan, Nov. 21, 1978, 53/161134
Int. Cl.³ A47K *11/02*
U.S. Cl. 4—449 **18 Claims**

1. A compost-type toilet comprising:

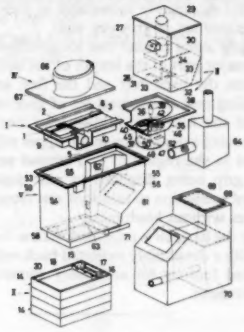
a bowl having a toilet stool disposed on the top thereat and having an opening formed inside the lower part to permit discharge of excrement;

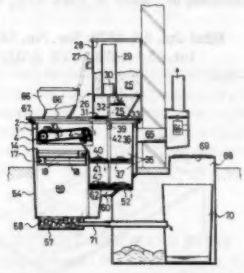
a solid-liquid separating means mounted below the above-mentioned opening, which comprises an endless revolving belt disposed in a frame member having a port for removing the liquid component disposed at the bottom of the frame and having an opening for transferring the solid component disposed on one side of the frame;

means for treating the liquid component provided beneath the above-mentioned solid-liquid separating means, and comprising a plurality of units disposed one atop the other and packed inside with adsorbent material for the liquid component and having an opening formed to allow excessive liquid component and air to flow down and to circulate, respectively;

means for treating the solid component provided in communication with the above-mentioned means for treating the liquid component, which comprises an upper half which is means for supplying an auxiliary agent for treatment of the solid component and a lower half which is a treatment chamber equipped with a stirring device for mixing the solid component with an auxiliary agent for treatment of the solid component;

storing means having a casing shape disposed in communication with the above-mentioned means for treating the solid component;





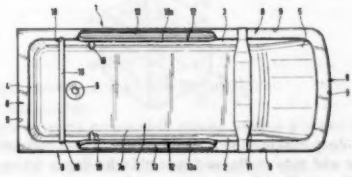
an air ventilating device comprising an air ventilating means mounted at a predetermined position in a ventilating passage in communication with the inside of the above-mentioned means for treating a liquid component.

4,254,516

BATH TUBS

Hans A. V. Johansson, Trehäradsvägen 36, Eslöv, Sweden (S-241 00)

Filed May 21, 1979, Ser. No. 41,020
Claims priority, application Sweden, May 26, 1978, 7806055
Int. Cl.³ A47K *3/00*
U.S. Cl. 4—559 **9 Claims**



1. A bathtub, particularly for use by patients and elderly persons, comprising:

a bathing compartment defined in part by opposing longitudinal side walls, a head-end wall, and a foot-end wall, said walls having upper edge portions;

a first set of mutually opposing generally vertical grooves disposed in said longitudinal side walls nearer said foot-end wall than said head-end wall;

a second set of mutually opposing generally vertical grooves disposed in said longitudinal side walls nearer said head-end wall than said first set of grooves;

a back rest detachably mountable near said head end;

a foot rest detachably mountable in either said first set or said second set of grooves; and

a hand grip along at least one longitudinal side wall extending a major part of the length of the bathing compartment between the back rest and the first set of grooves and extending past the second set of grooves in the direction toward the foot end, said at least one longitudinal side wall having a depression in the upper edge portion thereof at least in the region of said second set of grooves, said hand grip being disposed in said depression to permit upward extraction of said foot rest from the second set of grooves without hindrance,

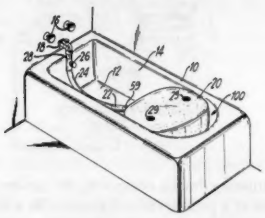
whereby the bathtub is provided with at least one hand grip, and with a detachably mounted backrest and a detachably mounted footrest for adjustably partitioning the bathing compartment.

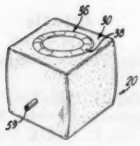
4,254,517

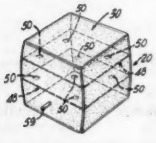
BATHTUB CUSHION LIFT ASSEMBLY

Harry H. Herman, Jr., 4620 N. Park Ave., Chevy Chase, Md. 20015

Filed Jul. 10, 1979, Ser. No. 54,794
Int. Cl.³ A47K *3/12, 3/022*
U.S. Cl. 4—564 **15 Claims**







1. In a cushion lift assembly for use in a bathtub having a floor and side walls, said assembly having a water inflatable cushion shell of flexibly substantially non-elastic material with side wall portions compressively engaging the bathtub interior side walls, the improvement comprising:

a bottom panel of said assembly adapted to be disposed in interfacial engagement with the floor of said bathtub and having a substantially rigid portion, said substantially rigid portion extending from one edge of said panel to an opposite edge thereof and of sufficient width for substantially preventing rolling or rotating displacement of said bottom panel in the bathtub during use.

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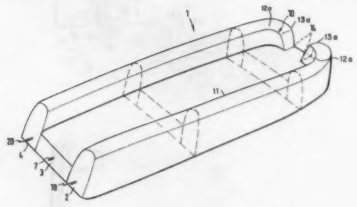
VACUUM MATTRESS, PREFERABLY FOR RESCUE VEHICLES

Wolfgang Buhren, Weissach; Rainer Hoefs, Schwieberdingen, and Ulrich Bez, Gerlingen, all of Fed. Rep. of Germany, assignors to Dr. Ing. hc.F. Porsche Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany

Filed Jun. 25, 1979, Ser. No. 51,748
Claims priority, application Fed. Rep. of Germany, Jun. 23, 1978, 2827589
Int. Cl.³ A47C *27/10, 21/08*
U.S. Cl. 5—450 **2 Claims**



1. In a vacuum mattress of the type comprising a casing means loosely filled with a multitude of synthetic plastic components so as to enable the mattress to adapt in shape to the body contour of a person thereon, and means placed in the casing for evacuation thereof, the improvement wherein said casing means is comprised of a central horizontal mattress element and vertical support elements extending along the longitudinal sides of said central mattress element, wherein each support element has a ring segment shaped section for supporting a person's shoulders, wherein the support elements form an opening for the head area of a patient, and wherein said central element and support elements are formed by separate casings at least some of which are interconnected by valve means forming part of said means for evacuating said casing means and serving for separately or jointly evacuating said casings.

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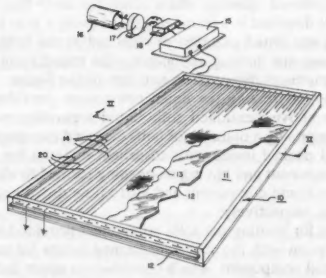
METHODS AND APPARATUS FOR COLLECTING BEE VENOM

James A. Vick, 3913 Linda La., Annandale, Va. 22003, and Charles S. Castner, 213 Revere Blvd., Lincoln Park, Reading, Pa. 19609

Filed Aug. 23, 1979, Ser. No. 68,946
Int. Cl.³ A01K *55/00*
U.S. Cl. 6—12 R **5 Claims**



1. An apparatus for collecting bee venom comprising a glass plate mounted within a frame work, a fabric removably and directly engaging said glass plate and contained within said frame work, said fabric being formed of finely woven strands

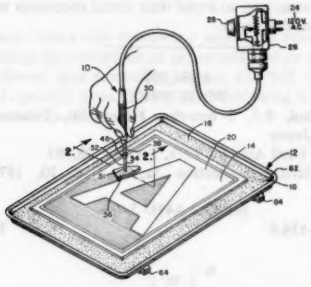
which strands have a surface generally impenetrable to a bee stinger and to the barbs associated therewith, whereby said stinger may pass between the strands without catching thereon, a plurality of spaced parallel wires extend across the frame work and in contact with said fabric, said wires being arranged above the fabric opposite the glass plate in alternate pairs of opposite polarity whereby bees coming in contact with any such pair receive an electrical shock.

4,254,520

BATIK PROCESS AND APPARATUS

Judith B. Saurman, Box 310 Woodbine Rd., Shelburne, Vt. 05482

Filed Sep. 29, 1978, Ser. No. 947,188
Int. Cl.³ D06P 5/12
U.S. Cl. 8—447 **4 Claims**



1. A process for applying a design to a fibrous material by providing a source of wax whereby a portion of said fibrous material can be waxed prior to dyeing so that the waxed portion resists dye, comprising:

maintaining a source of wax in a heatable container;

positioning at least a portion of a fibrous material adjacent said source of wax so that at least a portion of said fibrous material contacts wax about only one of its sides;

applying controlled heat at least to a portion of said fibrous material opposite said wax to melt a portion of said wax so as to wax said portion of fibrous material and repeating;

periodically heating said source of wax to provide a smooth upper surface to said source of wax;

dyeing said fibrous material after said wax portion has cooled under conditions sufficiently mild so as not to substantially destroy the waxed portion; and

optionally removing the wax prior to repeating the steps of waxing and dyeing.

4,254,521

ANCHORED MARINE FLUID TRANSFER BUOY

Fritz Papmahl, Königswinter, Fed. Rep. of Germany, assignor to LGA Gas and Marine Consult GmbH, Remagen-Rolandseck, Fed. Rep. of Germany

Filed Aug. 10, 1978, Ser. No. 932,527
Claims priority, application Fed. Rep. of Germany, Aug. 18, 1977, 2737228
Int. Cl.³ B63B 21/52, 51/02
U.S. Cl. 9—8 P **23 Claims**

1. An anchored marine fluid transfer buoy comprising:

(a) an anchor plate affixed to the sea bed;

(b) a buoyed tower having its top extending above the surface of the sea;

(c) cardan joint means having at least one cardan axis for connecting the bottom of said tower to said anchor plate;

(d) at least one pressure tank;

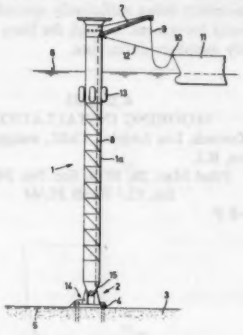
(e) a fluid supply line;

(f) first connection means coaxial with said at least on cardan axis for connecting said fluid supply line to said at least one pressure tank;

(g) a riser line from said at least one cardan joint means up said tower above the surface of the sea;

(h) second connection means between said first connection means and said riser line;

(i) the interior of said at least one pressure tank being substantially free of water;



(j) at least part of said second connection means being within the interior of said at least one pressure tank; and

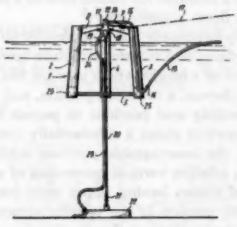
(k) said fluid supply line, first connection means, second connection means and riser line forming a fluid-tight conduit effective to isolate said fluid from contact with said cardan joint means.

4,254,522

SINGLE-POINT MOORING BUOY

Willem J. van Heijst, Monaco, Monaco, assignor to Bluewater Terminal Systems N.V., Curacao, Netherlands Antilles

Filed Jan. 29, 1979, Ser. No. 7,598
Claims priority, application Netherlands, Jan. 30, 1978, 7801062
Int. Cl.³ B63B 21/52
U.S. Cl. 9—8 P **5 Claims**



1. A single point mooring buoy including:

(a) a ground anchor;

(b) a high strength connecting means having a lower end connected to the ground anchor, and having an upper end adapted for connection to a buoy member; and

(c) a buoy member adapted to have a substantial portion thereof submerged during use, the buoy member comprising a plurality of buoyancy members which are linked in spaced relationship to provide an open structure, the structure defining an upper end of the buoy member to project above water level during use, an open lower end of greater cross-section than the upper end to be submerged during use, and a hinge which is mounted at the upper end of the buoy member to be above water level

during use, the hinge being positioned centrally relatively to the buoyancy members;

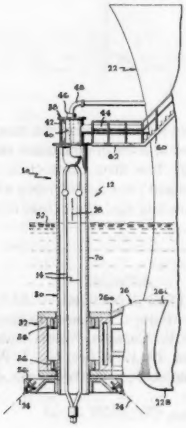
the upper end of the connecting means extending through an open lower end of the buoy member and being hingedly connected to the hinge, the buoyancy members being spaced about the upper end of the connecting means to avoid contact between the connecting means and the buoyancy members during relative movement of the connecting means and the buoy member about the hinge under normal conditions, and the buoyancy members being sufficiently spaced from each other to permit water movement through the buoy member between the buoyancy members during use.

4,254,523

MOORING INSTALLATION

James M. Kentosh, Los Angeles, Calif., assignor to Amtel, Inc., Providence, R.I.

Filed Mar. 28, 1979, Ser. No. 24,609
Int. Cl.³ B63B *35/44*
U.S. Cl. 9—8 P **1 Claim**



1. An offshore terminal for connection to a pipeline lying at or near the sea floor, comprising:

a substantially negatively buoyant transfer structure lying at the sea surface, said transfer structure having a nonrotatable portion of a height which is much less than the depth of the sea thereat, a rotatable portion, and bearings rotatably connecting said portions to permit rotation of the rotatable portion about a substantially vertical axis with respect to the nonrotatable portions while substantially preventing relative vertical movement of said portions;

a plurality of chains having upper ends connected to the nonrotatable portion of the transfer structure and lower ends anchored to the sea floor;

a vessel having bow and stern ends;

a fluid conduit means extending upwardly from said pipeline near the sea floor through said transfer structure to said vessel, for carrying fluid between them, and including a fluid swivel at the top of said transfer structure;

a mooring structure having an outer end lying beyond an end of the vessel and rigidly fixed to said rotatable portion of said transfer structure, and having an opposite inner end fixed to said vessel;

said nonrotatable portion of said transfer structure being tall enough so that its upper end holds said swivel unit above water level and its lower end holds said chains below water level, at all safe buoyant conditions of the vessel including at least 20% and 100% buoyancy;

said mooring structure holding said transfer structure adjacent to the vessel end, at a distance much closer than the height of the transfer structure;

said nonrotatable portion of said transfer structure including an underwater chain holder which holds the upper ends of said chains at an underwater depth substantially no higher than the bottom of the vessel hull, to prevent the chains from hitting the vessel despite the adjacency of the transfer structure to the vessel;

said nonrotatable portion of said transfer structure including a tall hollow upstanding riser having a lower end fixed to said chain holder and an upper end lying above water, said rotatable portion of said transfer structure forming a frame surrounding the lower end portion of said riser and rotatably connected to it, said riser extending high above said rotatable frame and said rotatable frame and mooring structure lying at a level near the bottom of the vessel;

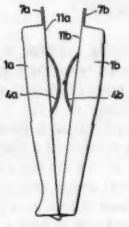
the portions of said fluid conduit which lie immediately below and above water level being surrounded by said transfer structure, to avoid their direct encounter with the surface of the water.

4,254,524

BOOT TREE

Yasuyuki Okui, 5-5, 5 ban-cho, Hiyoshidai, Takatsuki-shi, Osaka-fu, Japan

Filed Apr. 10, 1979, Ser. No. 28,793
Claims priority, application Japan, Dec. 20, 1978, 53-183144[U]
Int. Cl.³ A43D *5/00*
U.S. Cl. 12—114.6 **1 Claim**



1. A boot tree comprising a shin-shaped part and a calf-shaped part, both of said parts being integrally formed with a bow spring inwardly extending therefrom and being in the shape of an arc with the mid-portion thereof projecting beyond the plane of the inner brim of the respective part,

wherein a protuberance is provided in the mid-portion of the arc formed by one of said bow springs and a hole is provided in the mid-portion of the arc formed by the other so that said protuberance fits into said hole when said shin-shaped part and said calf-shaped part are put together,

and wherein a slit is formed in the longitudinal ridgeline of said shin-shaped part or said calf-shaped part so that one of them can be placed on the other with the bow spring on said one fitted in said slit in the other.

4,254,525

SUBMERGED SURFACE VACUUM CLEANER

H. E. Buddy Combest, Huntington Beach, Calif., assignor to Aladdin Equipment Company, Huntington Beach, Calif.

Filed Jul. 12, 1979, Ser. No. 56,862
Int. Cl.³ E04H *3/20*
U.S. Cl. 15—1.7 **10 Claims**

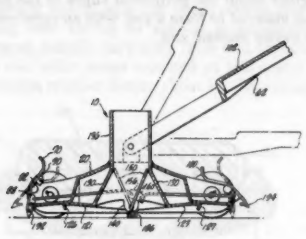
1. A liquid submerged surface vacuum cleaning system, comprising,

a housing,

a brush element attached to said housing and adapted to separate said housing into first and second compartments,

a means integral with said housing for evacuating said first and second compartments of said housing,

a wing movably secured to said housing and adapted to move upon passage of said housing through said liquid,



a means within said evacuating means for selectively controlling the evacuation of either said first or second compartment, said controlling means attached to said wing and operable upon movement of said wing from a first to a second position.

4,254,526

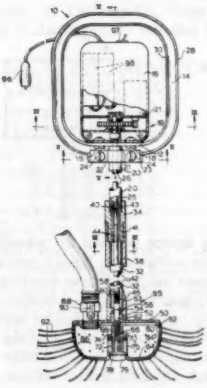
CAR WASHING AID

George R. Fromm, 1225 Hawthorne La., Glenview, Ill. 60025

Filed Jul. 23, 1979, Ser. No. 59,692

Int. Cl.[3] A46B *13/04*

U.S. Cl. 15—29 16 Claims



1. A hand-held washing aid having an elongate rotatable drive shaft, a non-rotating tube surrounding said drive shaft, a handle assembly for supporting said tube at one end, said handle assembly comprising a handle and an electric motor for rotating said shaft, and a brush mounted at the end of said shaft remote from said handle assembly and adapted to be rotated thereby, said brush having an interior chamber for receiving water from a water supply and a direct connection to said water supply independent of said tube and shaft, and a wall of said chamber being perforated to allow water to flow outwardly from the interior of said brush.

4,254,527

WINDOW CLEANING IMPLEMENT

Peter H. Pfeifer, Saentisstrasse 144, 1000 Berlin 48, Fed. Rep. of Germany

Filed Feb. 21, 1979, Ser. No. 4,640

Claims priority, application Fed. Rep. of Germany, Feb. 6, 1978, 2805316

Int. Cl.[3] A47L *13/14, 23/04*

U.S. Cl. 15—121 4 Claims

1. An improved window cleaning implement of the type including a support plate having a handle secured thereto and having a groove therein adjacent one end of the plate and extending transverse to the direction of movement of the plate during a cleaning operation, a wiper blade mounted on the plate within the groove for contacting the window during a cleaning operation, and a wiping cloth supported by the plate for contacting the window during a cleaning operation and having one end attached to one side of the wiper blade, wherein the improvement comprises:

an elastic strip extending from the other side of the wiper blade and having its free end secured to said one end of the support plate for floatably mounting the wiper blade within the groove, said groove being dimensioned so as to permit movement of the wiper blade therein during a cleaning operation.

4,254,528

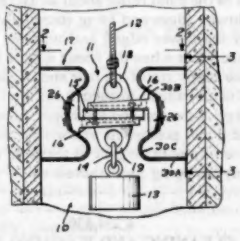
CHIMNEY SWEEPING DEVICE

Andre A. Souliere, 219 West St., Biddeford, Me. 04045

Filed May 2, 1979, Ser. No. 35,417

Int. Cl.[3] F23J *3/02*

U.S. Cl. 15—163 12 Claims



1. A device for use in sweeping chimney flues the cross sectional areas of which are within a predetermined range, said device to be suspended by a line in and moved vertically in such a flue, said device including a support, two sets of bristles, one for each of two opposite sides of said support, each set including two bristle units of substantial length and of tempered steel, each unit including a web and a series of integral

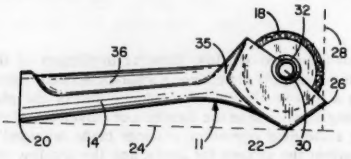
bristles extending along at least one margin outwardly therefrom relative to the support, said support also including transverse holders, one at each of said two sides thereof, means connecting the webs of the two units of each set lengthwise to the appropriate one of said holders with end portions of the webs and bristle series overlapping and with at least the overlapping portions of the webs in mutual contact, said means operable to enable the effective length of each set to be adjusted as required by the transverse dimensions of the wall to be cleaned, and at least one of said holders adjustable relative to said support to enable the distance between said bristle sets to be varied to effect engagement of said bristles with each opposite walls, and means connected to said support to which the line is attachable with the two sets then held horizontally when suspended thereby.

4,254,529

PAINT-APPLYING ROLLER FRAME WITH PAINT DRIP CATCHING SHIELD

Donald R. Cooke, Minneapolis, Minn., assignor to Padco, Inc., Minneapolis, Minn.

Filed Aug. 24, 1979, Ser. No. 69,321
Int. Cl.³ B05C *17/02*
U.S. Cl. 15—230.11 **3 Claims**



1. A paint applying roller apparatus comprising:

a paint roller;

a frame for rotatably engaging the paint roller, the frame comprising an integral paint roller shield and handle; wherein the shield includes a top, first and second ends, and front and rear sides having essentially parallel lower edges which define a plane and having essentially parallel upper edges connected to front and rear edges of the top, respectively; wherein the handle is substantially straight, is connected to the shield at the connection of the upper edge of the rear side and the rear edge of the top, and has a longitudinal axis which forms an angle of intersection of between about 40° and about 50° with the plane defined by the lower edges of the front and rear sides; and

roller mounting means for rotatably attaching the paint roller to the first and second ends of the shield to permit rotation of the paint roller about an axis essentially parallel to the lower edges and lying essentially in the plane defined by the lower edges; and wherein the handle has a length such that when the frame is in an inverted position, the frame stably rests on a rear end of the handle and on a portion of the shield formed from the connection of the front edge of the top and the upper edge of the front side with the shield positioned below the paint roller to intercept vertical planes tangent to the paint roller and thus to catch any dropping paint therefrom.

4,254,530

CLEANING AND WASHING PAD

Ralph G. Lambert, Methuen, Mass., assignor to Drutan Products, Inc., Haverhill, Mass.

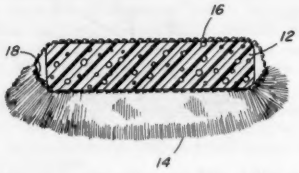
Filed Nov. 13, 1979, Ser. No. 93,838
Int. Cl.³ A47L *13/38*
U.S. Cl. 15—235 **16 Claims**

1. A cleaning-pad material, which pad material comprises in combination:

(a) a soft natural or synthetic shearling material, having a fluffy, water-absorbing surface, forming one surface of the pad;

(b) a tough, synthetic, mesh material forming the other surface of the pad;

(c) the shearling material and the mesh material secured together about the peripheral edges of the shearling and mesh material to form a pad with an open end and a hollow cavity therein; and



(d) a soft, resilient, cellular material comprising an open-cell, water-absorbing, foam material positioned within and substantially filling the hollow cavity to provide bulk and body to the pad,

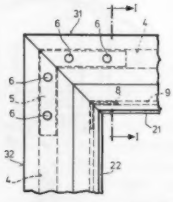
whereby the pad material presents a soft, water-absorbing, shearling surface for washing, and the mesh material presents a tough scrubbing surface for the removal of difficult-to-remove objects from a washing surface.

4,254,531

STRIPPING DEVICE

Kurt Hennig, Munich, and Manfred Klein, Ismaning, both of Fed. Rep. of Germany, assignors to Gebr. Hennig GmbH, Ismaning, Fed. Rep. of Germany

Filed Jun. 1, 1979, Ser. No. 44,771
Claims priority, application Fed. Rep. of Germany, Jun. 6, 1978, 7816943[U]
Int. Cl.² F16C *29/08*
U.S. Cl. 15—256.5 **19 Claims**



1. A stripping device adapted for mounting on a machine tool and the like comprising holder means composed of a plurality of separate holder sections abutting one another with a joint therebetween, each of said holder sections having a recess therein, the recess in each holder section being in communication with the recess in the abutting holder section; a plug-type connecting element non-rotatably accommodated in the recess of each adjacent holder section and spanning the joint therebetween; and a stripping lip carried by each of said holder sections and projecting beyond one edge thereof.

4,254,532

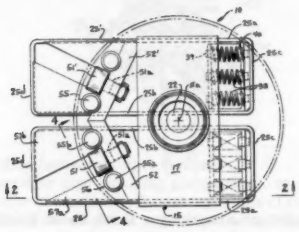
CASTER APPARATUS

Clarence H. Hager, Rockford, Ill., assignor to Modern Suspension Systems, Inc., Rockford, Ill.

Filed Nov. 3, 1978, Ser. No. 957,481
Int. Cl.³ B60B *33/00*
U.S. Cl. 16—20 **10 Claims**

1. In a caster apparatus of the type including a mounting base adapted to be rigidly attached to a vehicle, caster bracket

means, bracket mounting means mounting the caster bracket means on the mounting base for swivel motion relative thereto about an upright swivel axis, ground engaging wheel means, and means rotatably mounting the ground engaging wheel means on the caster bracket means for rotation about a generally horizontal wheel axis horizontally offset in one direction from said upright swivel axis, the improvement comprising: said mounting base having an annular downwardly facing trackway spaced radially outwardly from said upright swivel axis, at least one roller means mounted on said caster bracket means for rotation relative thereto about a roller axis extending



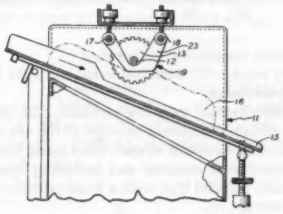
radially of said swivel axis at a location above said wheel axis and in rolling engagement with said annular trackway, and at least two pad means mounted on said caster bracket means at locations to engage said annular trackway angularly adjacent relatively opposite sides of said roller means, said pad means being movable with said caster bracket means and yieldably biased upwardly into sliding engagement with said annular trackway to wipe said trackway in advance of the roller means when the caster bracket means swivels in either direction about said swivel axis and to dampen swivelling of said caster bracket means about said swivel axis.

4,254,533

MEAT PROCESSING MACHINE

Salvatore J. LoBiondo, 12 DeCamp Ct., West Caldwell, N.J. 07006, and Joseph V. LoBiondo, 79 Winding La., Bloomfield, N.J. 07003

Filed Aug. 30, 1979, Ser. No. 71,309
Int. Cl.³ A22C *9/00*
U.S. Cl. 17—27 **2 Claims**



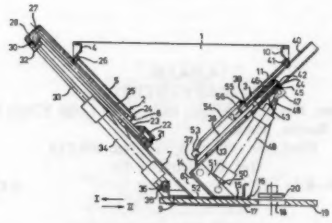
1. A meat processing machine comprising,
(a) a rotatably mounted blade shaft for macerating blades,
(b) a plurality of macerating blades mounted on the blade shaft,
(c) means to position the macerating blades in spaced relation to each other,
(d) a meat supporting table below the macerating blades, in spaced relation thereto, sufficiently close to the macerating blades to forcibly engage a piece of meat traversing the table in contact with the macerating blades,
e) a first stripper shaft rigidly mounted above the macerating blade shaft,
(f) a second stripper shaft rigidly mounted above the macerating blade shaft,
(g) a pluraity of generally L-shaped arms with a generally rectangular cross-sectional area defining meat compressors and strippers mounted at opposite ends on the first and second stripper shafts and extending under the blade shaft,
(h) a first wide latitudinal section of each L-shaped arm attached to the first stripper shaft,
(i) a second wider latitudinal section of each L-shaped arm wider than the first wide latitudinal section attached to the second stripper shaft to rigidly resist deformation,
(j) each arm having a relativly wide, flat blunt edge defining a compressor surface,
(k) means for disposing the L-shaped arms in spaced relation to each other and in spaced relation to and between the macerating blades,
(l) the arms extending toward the meat table for a distance less than the distance of the periphery of the macerating blade to the meat table.

4,254,534

APPARATUS FOR USE IN THE MANUFACTURE OF DISC-LIKE PRODUCTS

Wilhelmus F. A. Koppens, Hoekendaal 12, 5761 CK Bakel, Netherlands

Filed Feb. 6, 1979, Ser. No. 9,770
Claims priority, application Netherlands, Feb. 10, 1978, 7801537
Int. Cl.³ A22C *7/00*
U.S. Cl. 17—32 **10 Claims**



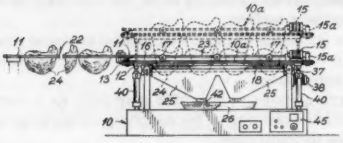
1. Apparatus for use in the manufacture of disc-like products from semi-solid foodstuffs,
said apparatus comprising a hopper including a first side wall having first and second offset portions, an interconnecting wall portion and a pair of additional side walls disposed laterally of the first side wall,
a compression chamber having a side wall and an inlet communicating with the hopper,
a plate having at least one aperture for receiving foodstuff from the compression chamber and for forming said foodstuff into disc-like products,
said first side wall portion being inclined relative to the plate and lying in the same plane as the side wall of the compression chamber,
a pusher slidable along the first side wall portion and within the hopper for advancing foodstuff from the hopper into the compression chamber,
a rod secured to the pusher and extending outside the hopper through the interconnecting wall portion,
a control cylinder extending along the outer side of the first side wall and being coupled to the rod,
said pusher comprising a body extending transversely of said first side wall and between the two additional side walls, said body having one position which is substantially close to the inlet opening of the compression chamber.

4,254,535

METHOD AND AN APPARATUS FOR MAKING BASIC MATERIAL FOR THE PRODUCTION OF A BIOLOGICALLY ACTIVE PREPARATION

Ernst L. Pedersen, Tastrup, and Erik Balslev, Fredensborg, both of Denmark, assignors to A/S Orthana Kemisk Fabrik, Kastrup, Denmark

Filed Jul. 26, 1979, Ser. No. 61,071
Claims priority, application Denmark, Aug. 2, 1978, 3437/78; Nov. 27, 1978, 5291/78
Int. Cl.[3] C07G 7/026; A22C 17/06; A22B 5/18
U.S. Cl. 17—45 35 Claims



1. A method of making a basic material for the production of a biologically active preparation from stomachs of swine, said method comprising:

turning the inside of each said stomachs out so as to expose the fundus region thereof, said fundus region including a membrane having mucous cells thereof, and

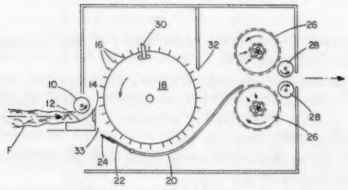
mechanically separating said cells from said membrane, whereby said membrane is left on said stomach.

4,254,536

FIBER CUTTER

Peter Lehner, Hingham, Mass., assignor to Leigh Fibers Incorporated, Boston, Mass.

Filed Dec. 28, 1979, Ser. No. 108,019
Int. Cl.[3] D01G 1/04
U.S. Cl. 19—0.6 6 Claims



1. A device for producing short lengths of fiber from a non-oriented batt of fibers which comprises

a transversely-extending first knife,

a feedroll mounted to cooperate with said batt and said first knife to move said batt across said first knife,

guide means to guide said batt between said feedroll and said first knife,

a combing roll mounted for rotation about a transverse axis adjacent said first knife, said combing roll having

a cylindrical outer surface,

a multiplicity of pins extending therefrom,

and

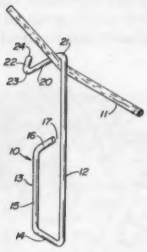
at least one second knife blade carried thereby and extending generally transversely for cooperation with said first knife blade to provide a cutting action.

4,254,537

LINE TIGHTENER

Joseph J. Malacheski, and Richard J. Zenda, both of 32 Warner St., Wilkes-Barre, Pa. 18703

Filed Mar. 17, 1978, Ser. No. 887,784
Int. Cl.[3] A44B 21/00
U.S. Cl. 24—71.3 7 Claims



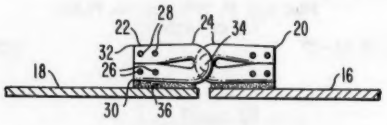
1. A line tightener comprising a shank about which a line portion can be wound into convolutions to take up on a line, a transverse extension on one end of said shank extending at an acute angle to said shank, and a receiver on said extension spaced from and opening generally toward said one end of said shank for receiving a line region spaced from said line portion and said one shank end, said line region being urged by tension along the outer side of said extension toward said one shank end to tightly frictionally engage said convolutions and resist unwinding of the line from said shank.

4,254,538

SLIDE FASTENER INSTALLATION AND METHOD OF MAKING THE SAME

Charles T. Lawrence, Saegertown, Pa., assignor to Textron, Inc., Providence, R.I.

Filed Oct. 29, 1976, Ser. No. 737,161
Int. Cl.[3] A44B 19/04
U.S. Cl. 24—205 R 1 Claim



1. A slide fastener installation comprising

a single unitary sheet of knitted fabric having a slit formed partway therethrough,

two trains of slide fastener coupling elements each mounted on the sheet of fabric adjacent an edge of the slit therein,

each of the coupling elements of each train being formed of molded thermoplastic material and including upper and lower generally parallel legs with a head portion extending therebetween,

coupling threads extending through the legs of each coupling element to join the coupling elements of each train,

a slider entrained on the trains for engaging and disengaging the coupling elements of the trains,

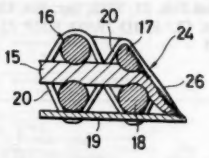
a layer of heat-activated adhesive material bonding the respective lower leg of each of the coupling elements of each of the trains to an edge of the sheet of fabric along the slit therein, and

an end portion of each of the trains extending onto the sheet of fabric beyond the slit therein, the coupling elements of each train in the end portion being interengaged and adhered to the sheet of fabric to form an end stop for the slide fastener.

4,254,539
SLIDE FASTENER STRINGER

Hiroshi Yoshida, Uozu, and Shunji Akashi, Kurobe, both of Japan, assignors to Yoshida Kogyo K K, Tokyo, Japan

Continuation of Ser. No. 903,189, May 5, 1978, abandoned. This application Dec. 19, 1979, Ser. No. 105,292
Claims priority, application Japan, May 10, 1977, 52-53297
Int. Cl.[3] A44B *19/00*
U.S. Cl. 24—205.11 F 1 Claim

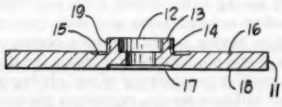


1. A slide fastener stringer comprising:
(a) a stringer tape including thermoplastic synthetic fibers;
(b) a row of continuous fastener elements of the zigzag type made of thermoplastic synthetic resin and mounted on and along one longitudinal edge of said stringer tape, each of said fastener elements including an upper leg and lower leg;
(c) reinforcing means extending along said row of continuous fastener elements and being disposed on one side of said lower legs of the elements which is remote from the stringer tape; and
(d) sewing threads fixing said fastener elements and said reinforcing means to said stringer tape, there being a cut edge in which the upper leg of a terminal one of said fastener elements is fused with said sewing thread thereabout extending under tension toward said reinforcing means which is located remotely from said terminal upper leg, said stringer tape extending around and beyond the lower leg of said terminal one of fastener elements away from said last-named upper leg toward the reinforcing means, the portion of the stringer tape which extends beyond said last-named lower leg being disposed substantially parallel to said tensioned sewing thread, said stringer tape, said reinforcing means, and said tensioned sewing threads jointly hold said terminal one of said fastener elements in a fixed position are are integrally fused together therewith, and the distal ends of the sewing threads and stringer tape are united integrally with the reinforcing means, and said cut edge extending transversely of the stringer tape and having a substantially flat surface slanted with respect to the plane of said stringer tape.

4,254,540
STAMPED BEVEL GEAR

William Bilak, 24799 Lake Shore Blvd., Euclid, Ohio 44123

Filed Sep. 27, 1978, Ser. No. 894,538
Int. Cl.[3] B21D *53/28*; B21K *1/30*; B23P *15/14*
U.S. Cl. 29—159.2 12 Claims

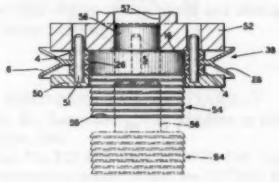


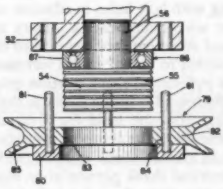
1. A method for manufacturing a gear form having an integral hub with a central opening for receiving a drive shaft having a predetermined cross-sectional shape, said method comprising the steps of:
(a) piercing a hole defined by an edge in a metal stock workpiece;
(b) forming a protrusion in the region of the stock including the hole, without substantially restricting the flow of displaced metal along the length of the protrusion;
(c) compressing the protrusion with no forming tools in the hole, to a predetermined height without substantially restricting the flow of the displaced metal into the edge of the hole; and
(c) piercing the region surrounding the hole to the cross-sectional shape of the drive shaft.

4,254,541
METHOD OF MAKING CLUTCH HOUSING AND PULLEY ASSEMBLY

Richard C. St. John, North Canton, Ohio, assignor to Aspro, Inc., Canton, Ohio

Filed Nov. 6, 1978, Ser. No. 957,706
Int. Cl.[3] B23P *9/00, 19/02*
U.S. Cl. 29—445 19 Claims





6. Method of making a clutch housing and pulley assembly including the steps of:
(a) stacking together a pulley member and a plurality of discs, with said pulley member being sandwiched between at least a pair of said discs, and with central openings formed in the pulley member and discs being in axial alignment;
(b) sizing the aligned central openings of the pulley member and discs by passing a sizing tool through said openings;
(c) press fitting bearing means in the sized central openings of the pulley member and discs to form a subassembly; and
(d) mounting a clutch housing on the subassembly with certain of the discs spacing the clutch housing from the pulley member.

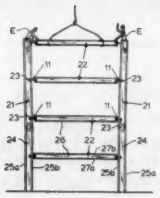
16. A method of installing a bearing in a generally annular-shaped member having a central opening including the steps of:
(a) mounting the annular-shaped member on support and alignment means;
(b) loading a bearing on a hole sizing tool; and
(c) in a single step, sizing the central opening of the annular-shaped member by passing the sizing tool through said opening and press fitting the bearing within the sized opening upon continued movement of the sizing tool through said opening.

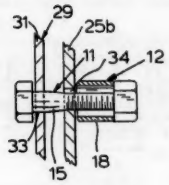
4,254,542

CONSTRUCTION NUT AND BOLT ASSEMBLY AND METHOD OF ERECTING STRUCTURAL STEEL

Gerald V. Craig, Box 40A, Birneys Star Route, Sheridan, Wyo. 82801

Filed Apr. 11, 1979, Ser. No. 28,971
Int. Cl.³ B23Q *3/00*; B25B *27/14*; F16B *35/00*
U.S. Cl. 29—464 **6 Claims**





4. A combination erection bolt, drift pin and nut assembly for co-operating with bolt holes in adjacent components to be bolted together which comprises a unitary member having a head with an end abutment face larger than the bolt hole in an adjacent component to be bolted for surrounding said hole, a smooth surface cylindrical shank portion extending from said face having a diameter for fitting freely in the bolt holes, and a length extending from the head for a distance equal to the combined thicknesses of the components to be bolted together, a tapered smooth surface shank portion converging from the end of the cylindrical shank portion at an angle from 10 to 30 degrees and an exteriorly threaded cylindrical shank portion extending from the small end of the tapered portion having a diameter smaller than the diameter of the bolt holes and a length sufficiently long to permit adjoining components to be joined by the bolt to hang loosely relative to each other, a sleeve loosely receiving the tapered shank portion, a nut threaded on said threaded shank portion, for thrusting against said sleeve, and said tapered shank portion being adapted to be drawn through the holes by the nut threaded on the threaded shank portion for aligning the holes on the smooth surface cylindrical shank portion.

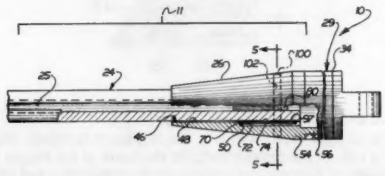
6. A method of erecting structural columns and beams having parts with co-operating bolt holes to receive erection bolts which comprises erecting a tier of upright columns, suspending horizontal beams between adjacent columns, inserting bolts into some of the bolt holes with smooth surface grip portions, smooth surface tapered portions converging from the grip portions, and externally threaded shank portions extending from the small ends of the tapered portions through the holes of both the beams and the columns, prying the beams with the bolts into approximate alignment with the columns, loosely threading nuts on the projecting portions of the threaded shanks of the bolts, loosely hanging the beams from the columns through said bolts and nuts, removing the nuts, slipping sleeves over the threaded shanks of the bolts, threading nuts on the threaded shanks against the sleeves to pull the tapered portions of the bolts through the holes seating the grip portions of the bolts in the holes thereby aligning co-operating pairs of holes in the columns and beams, inserting permanent bolts in these alinged holes, tightening nuts on the permanent bolts and thereafter replacing the bolt, sleeve and nut assemblies with permanent bolts and nuts.

4,254,543

METHOD OF MAKING FORESTAY CONNECTOR

Paul Blonski, Brecksville, Ohio, assignor to Hyde Products, Inc., Westlake, Ohio

Filed Feb. 21, 1979, Ser. No. 13,248
Int. Cl.³ B21D *39/00*; B23P *11/00*
U.S. Cl. 29—517 **11 Claims**



1. A method of making a stay unit for use in a sailboat, said method comprising the steps of placing a sleeve member having a load-bearing surface upon which an axial load may be applied around one end portion of a stay rod member and positioning the sleeve member so that the surface provides an abutment for a collar disposed about said rod for coupling the end portion of said rod into a stay assembly with the sleeve member preventing movement of the collar over the sleeve and off the rod at the end portion, and deforming the rod and sleeve members by pressing against the outer side surface of the sleeve to indent and force the material of the one of said members into a recessed portion of the other of said members whereby axial loads may be transmitted between the collar and the rod through said sleeve member.

11. A method of manufacturing a stay unit having a metal stay rod, and a collar encompassing one end portion of said rod for coupling the end of the rod into a stay assembly, said method comprising the steps of positioning a sleeve on said one end portion of the rod to be inside said collar to provide an abutment limiting movement of said collar outwardly of said end portion, and cold forming the metal of the rod into transverse recesses in the interior surface of the sleeve to permanently attach the sleeve to the rod.

4,254,544

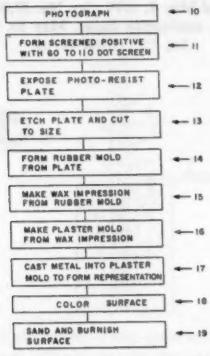
METHOD OF CASTING PHOTOGRAPHIC REPRESENTATION HAVING TONAL AND HEIGHT CONTRASTS AND THE ARTICLE SO CAST

Michael D. Barker, Bow St., Northwood, N.H. 03261

Filed Jun. 21, 1978, Ser. No. 917,707
Int. Cl.³ B22D *11/126*
U.S. Cl. 29—527.3 **4 Claims**

1. The method of producing a cast metal representation of a photograph having light-colored areas and color tones comprising medium-colored areas and dark-colored areas, said representation having height contrasts corresponding to the color tones of said photograph comprising the steps of forming a half-tone positive transparency of said photograph using a 60 to 110 mesh half-tone screen, exposing a photo-resistive coating present on a metallic etching plate to light passed through said half-tone positive, removing the unexposed areas of the photo-resistive coating and etching the metallic plate underlying said areas to produce an etching plate having etched recesses corresponding to the toned areas of said photograph, producing a mold of the etched surface of said etching plate, said mold having raised areas corresponding in height to the depth of said recessed etched areas and having recessed areas corresponding in depth to the height of the non-etched areas of said

etching plate, making a wax impression of said mold to cause the wax to enter said recessed mold areas and to trap air at the base of said recessed areas whereby said wax impression of said mold has raised areas of lesser height than the depth of the recessed ares of said mold and has recessed areas having a depth corresponding to the height of the raised areas of the mold, the areas corresponding to the light-colored areas of said photograph having a maximum height, the areas corresponding to the medium-colored areas of said photograph having an intermediate height surrounding recesses of intermediate depth



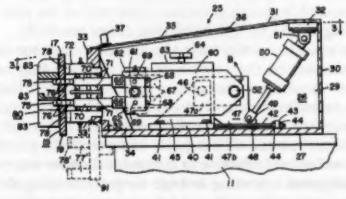
and the areas corresponding to the dark-colored areas of said photograph having a minimum height surrounding recesses of maximum depth, forming a casting mold from said wax impression and forming a metal representation of said photograph in said casting mold, said metal representation comprising raised or relief areas of maximum height corresponding to the light-colored areas of the photograph, raised or relief areas of intermediate height corresponding to the medium-colored areas of the photograph and non-raised areas corresponding to the dark-colored areas of the photograph.

4,254,545

MANUFACTURE OF DOORS FOR SAFE DEPOSIT BOX NESTS

Eldon C. Higgins, Cedar Rapids, Iowa, assignor to Kidde, Inc., Cedar Rapids, Iowa

Filed Apr. 27, 1979, Ser. No. 33,863
Int. Cl.³ B23P *13/00*
U.S. Cl. 29—558 **3 Claims**



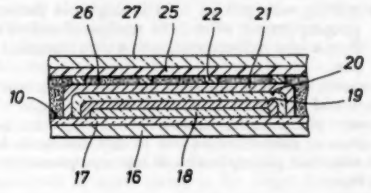
1. In the manufacture of doors for the compartments of safe deposit box nests from substantially uniformly oversized rectangular blanks of plate stock, each door in finished form having hinge, strike and side edges and front and rear faces with the rear face having provision for the mounting of a door lock thereon including a pair of spaced lock noses extending through the door from its rear to its front face, the improvement comprising: punching a pair of spaced lock nose holes through the door blanks uniformly located with respect to said edges; placing each door blank upon holding means, each holding means having a pair of parallel cantilevered draw members fittingly and slidably engageable with the door nose holes by sliding the door blank on the draw members through its nose holes so that the draw members extend axially therethrough in a forward direction from the front to the rear face of the door blank, whereby to support the door blank in a substantially vertical position, the draw members terminating in forward ends forwardly of the door rear face; engaging the forward ends of the draw members with removable clamp means carried by the draw members and defining a first clamping face engagable with the door rear face inboard of the door edges, the removable clamp means being thereupon effective to prevent withdrawal of the draw members axially from the nose holes in a rearward direction opposite said forward direction; moving the draw members and the removable clamp means in said rearward direction to cause the door front face to engage a second clamping face defined by portions of the holding means inboard of the door edges, whereby to clamp the door blank between said clamping faces; performing a plurality of door finishing operations upon the four edges and the rear face of the door blank by moving each holding means for same with the door blank in said clamped position from one to another of a succession of tool stations serially performing said operations upon the door blank; moving the draw members in said forward direction to unclamp the door blank after performance of said finishing operations thereof; and detaching the removable clamp means from and sliding the door blank off the draw members.

4,254,546

PHOTOVOLTAIC CELL ARRAY

Lee R. Ullery, Jr., Landenberg, Pa., assignor to SES, Incorporated, Newark, Del.

Division of Ser. No. 827,927, Aug. 26, 1977, Pat. No. 4,127,424, which is a continuation-in-part of Ser. No. 747,849, Dec. 6, 1976, abandoned. This application Sep. 11, 1978, Ser. No. 940,919
Int. Cl.³ B01J *17/00*
U.S. Cl. 29—572 **10 Claims**



1. A method of making an integrated array of connected, thin-film, photovoltaic cells comprising:

(1) providing a substrate of insulating material;

(2) coating a major surface of said substrate with a paste which upon heat treating provides a sintered conductive ceramic layer forming a plurality of electrically conductive bottom electrodes, a separate one of said bottom electrodes being for each of said cells, said paste comprising from about 5 to about 85 percent by weight of finely divided metal particles, from about 1 to about 75 percent by weight of a metal oxide capable of forming, upon firing, a metal oxide-silica complex, from about 2 to about 60 percent by weight of a glass frit compatible with and capable of bonding with said substrate, from about 0.05 to about 10 percent by weight of a screening agent(s) and from about 5 to about 45 percent by weight of a solvent;

(3) heat treating the paste coated substrate produced in step (2) above to dry and remove solvent and screening agents from said paste and to convert said paste to an electrically conductive ceramic which is bonded to said substrate, forming said bottom electrodes;

(4) coating each of said bottom electrodes, except for a

portion adjacent an edge thereof, with a film of first semiconductor material of one type conductivity;

(5) coating each of said films of one type conductivity with a relatively thin film of second semiconductor material of an opposite type conductivity, and forming a p-n junction therewith; and

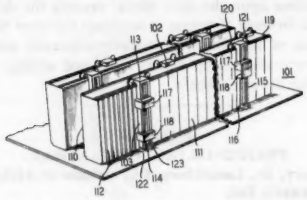
(6) attaching a light transmitting top electrode on each of said second semiconductor films, and connecting top and bottom electrodes of adjacent cells to provide series or parallel arrangement of the cells.

4,254,547

METHODS AND APPARATUS FOR AUTOMATIC JUMPER PLACEMENT

Arnold R. Smith, Chester, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Apr. 17, 1979, Ser. No. 30,751
Int. Cl.³ H01R *43/00*
U.S. Cl. 29—857 **18 Claims**



1. Automatic apparatus for placing jumper wire connections on a main distributing frame having a plurality of aligned connector blocks with wire troughs therebetween on the face of said frame, said apparatus

CHARACTERIZED BY

a rotating wire pick-up head having jaws thereon for grasping jumper wires to be terminated and rotatable from a wire pick-up position to a wire placement position,

a source of jumper wires for presenting jumper wire ends to said pick-up head,

a wire placement mechanism for securing wires in said jaws in connectors on one of said connector blocks when said pick-up head is in said wire placement position,

platform means for moving said pick-up head and said jumper wire source relative to each other and in alignment with said connector blocks, and

means for moving said platform means to selected connector blocks on said face of said frame.

14. A method of making automatic jumper connections between wire-piercing connectors arrayed in parallel vertical lines on the outer face of a main distributing frame, said vertical lines of connectors being separated by jumper wire retaining troughs therebetween, said method

CHARACTERIZED BY the steps of

(1) moving a jumper wire source to the vicinity of a first connector at one end of a desired jumper connection,

(2) pulling a jumper wire vertically from said jumper wire source to the vicinity of a second connector at the other end of said desired jumper connection, said jumper wire lying outside of said retaining trough,

(3) moving the pulled end of said jumper wire laterally to a position registered with said second connector,

(4) engaging said pulled end of said jumper wire end in said second connector,

(5) pushing the jumper wire length from said second connector to the vicinity of said first connector into said trough,

(6) severing said jumper wire at said jumper source,

(7) moving the severed end of said jumper wire laterally to a position registered with said first connector, and

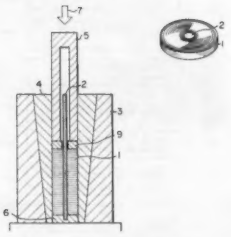
(8) engaging said severed end of said jumper wire in said first connector.

4,254,548

METHOD OF FABRICATING ELECTRODE PLATE FOR SUPPORTING SEMICONDUCTOR DEVICE

Hideo Arakawa; Keiichi Kuniya, and Masabumi Ohashi, all of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed May 8, 1979, Ser. No. 37,025
Claims priority, application Japan, May 10, 1978, 53/54480
Int. Cl.³ H01R *43/02*
U.S. Cl. 29—879 **11 Claims**



1. A method of fabricating a supporting electrode plate for a semiconductor device, comprising steps of coating surfaces of carbon fibers with copper, winding a bundle of said carbon fibers around a core rod under tension, hot-pressing said carbon fibers in the state of being wound around said core rod in a non-oxidizing atmosphere thereby to effect mutual diffusion at contacting areas of said copper coated on said carbon fibers and form an integral electrode plate, and finishing said electrode plate in a desired form for said supporting electrode plate.

4,254,549

CABLE CUTTER

Earl W. McMullin, Hastings, Mich., assignor to Hastings Fiber Glass Products, Inc., Hastings, Mich.

Filed Dec. 15, 1978, Ser. No. 969,995
Int. Cl.³ A01G *3/00*
U.S. Cl. 30—251 **9 Claims**

8. A manually operable cutting tool, comprising:

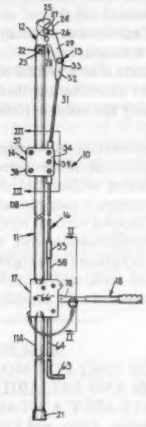
an elongated pole made of electrical insulating material;

a cutter assembly mounted on the upper end of the pole and actuating means for actuating said cutter assembly;

a linkage assembly comprising a guide and connector structure mounted on the exterior of said pole for lengthwise vertical movement therealong, cutter actuator linkage means extending upwardly from said guide and connector structure and connected to said actuating means so that vertical movement of said guide and connector structure along said pole is effective to actuate said cutter assembly, and elongated operating linkage means extending downwardly from said guide and connector structure, said operating linkage means being located on the exterior of said pole and extending substantially parallel therewith; and

manually operable ratchet mechanism mounted on said pole adjacent the lower end thereof, said manually operable ratchet mechanism comprising a ratchet having ratchet teeth thereon, a one-way driving pawl for engaging said ratchet teeth, means mounting said driving pawl for movement with respect to said pole to cause said ratchet to be moved stepwise by said driving pawl with respect to said pole, a manually operable handle for moving said driving pawl relative to said pole, said ratchet being con-

nected to said operating linkage means for effecting stepwise lengthwise vertical movement of said operating linkage means and thereby corresponding stepwise length-



wise vertical movement of said guide and connector structure relative to said pole in response to movement of said ratchet relative to said pole whereby to actuate said cutter assembly.

4,254,550

LAWN TRIMMER

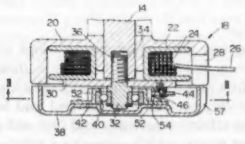
Masatoshi Satoh, Tokyo, Japan, assignor to Kioritz Corporation, Tokyo, Japan

Filed Aug. 16, 1979, Ser. No. 67,209

Claims priority, application Japan, Aug. 18, 1978, 53-112477[U]

Int. Cl.³ A01D *50/00*

U.S. Cl. 30—276 **1 Claim**



1. A trimmer comprising a housing rigidly fixed to the end of a rotating shaft, a spool around which a cutting nylon cord element is wound and which is contained in said housing, said cord element having its free end portion extending radially outwardly through the wall of the housing, a stub shaft threadedly received in said rotating shaft at its lower end, a support member fixedly secured to said stub shaft for holding said spool against the housing, a ground engaging disc rotatably mounted on said stub shaft by means of a bearing, a bearing casing secured to the inner surface of said disc and having grooves formed therein, and a pair of opposed spring loaded centrifugal elements pivotally mounted on said support member and engaging said grooves for connection of said disc with said support member during stoppage of the trimmer, said centrifugal elements being moved radially outwardly of said bearing casing under the centrifugal force during rotation of the trimmer to disengage from the grooves.

4,254,551

SCISSORS-LIKE TOOL

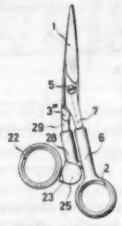
Salvatori G. Megna, Sacramento, Calif., and Günther Pracht, Solingen, Fed. Rep. of Germany, assignors to "Jaguar" Stahlwaren Vertriebsgesellschaft mbH & Co., Solingen, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 939,019, Sep. 1, 1978, Pat. No. 4,184,249. This application Sep. 4, 1979, Ser. No. 72,720

Claims priority, application Fed. Rep. of Germany, Mar. 16, 1978, 2811398

Int. Cl.³ B26B *13/00*

U.S. Cl. 30—341 **5 Claims**



1. A scissors-like tool, in particular a hairdressers', householding or tailors' scissors, including a movable scissors blade, a stationary scissors blade pivotally connected thereto, and two finger bows arranged at the rearward end of the scissors, at least one of said finger bows being made of synthetic material or the like and mounted in an outwardly open opening at the rearward end of the scissors, said scissors-like tool comprising

(a) a movable scissors blade (3'''') pivotally connected to a stationary scissors blade (1), each of said blades having a stock portion (29,7) and a finger bow (22,2) made per se of synthetic material or the like and fitted through the intermediary of a shank (28,6) to the respective stock portions of the blades to form handles for the scissors, and

(b) a finger bow retaining member having an outwardly directed edge open recess defining an outwardly open opening on at least one of said handles for holding one of the finger bows, the finger bow of said one handle carrying a spherical head (24) at its external circumference, by means of which head it is mounted easily rotatable in a complementary cup (25) defined by the inner side of the outwardly directed recess in the finger bow retaining member.

4,254,552

INSCRIBING SYSTEM

Philip L. Samis, 3470 Stanley St., Apt. 903, Montreal, Canada

Filed Jan. 22, 1979, Ser. No. 5,008

Int. Cl.³ B43L *13/00*

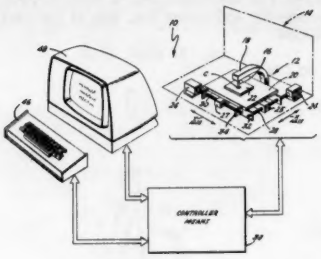
U.S. Cl. 33—18 R **15 Claims**

1. A system for inscribing α-numeric characters onto a miniature carrier chip comprising a substrate consisting of hard inert material having a high melting point and a surface layer for inscribing said characters for embedding into mineral tissue of humans or animals for purpose of reference at a future date comprising:

means for inscribing α-numeric characters onto a surface of said carrier chip;

a first means for controlling the relative displacement of said inscribing means and the carrier chip with respect to each other in the direction of a first axis along the carrier chip surface, and a second means for controlling the relative displacement of said inscribing means and the carrier chip with respect to each other in the direction of a second axis along the carrier chip surface, said relative displacement being upon inscribing contact of said inscribing means and the carrier chip surface;

a controller means for controlling the movement of each of said first and second displacement means said controller means including a microprocessor with a memory and a plurality of peripheral interface adaptors for interfacing between said microprocessor and other elements of said system, one of said interface adapters interfacing between



said means for inscribing characters and said microprocessor and another interface adapter interfacing between said microprocessor and a character display means;

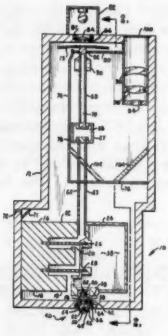
means for selecting characters to be inscribed on the carrier chip and for signaling to said controller means the designated characters to be inscribed and means for displaying the selected characters.

4,254,553

MEASURING DEVICE

Andrew C. Johnson, Joplin, Mo.

Filed Feb. 21, 1979, Ser. No. 13,241
Int. Cl.³ G01B 3/22
U.S. Cl. 33—169 R **8 Claims**



1. A measuring device suitable for use as the indicator in a comparator test set, said measuring device comprising:

an outer housing;

a stationery block fixedly secured to said outer housing;

a movable block;

a pair of gauging pressure and guide springs for coupling said movable block to said stationary block such that said movable block is capable of moving relative to said stationary block;

means for imparting movement to said movable block in response to a measurement;

a first vertical reed fixedly secured to said stationery block such that said first vertical reed projects outward from said stationary block;

a second vertical reed fixedly secured to said movable block to move in combination therewith, said second vertical reed being secured to said movable block such that said second vertical reed projects outward from said movable block and is generally parallel to said first vertical reed;

a bouyant joining piece for coupling said first vertical reed with said second vertical reed such that said bouyant joining piece is capable of moving through an arc in response to movement of said second vertical reed in response to a measurement;

an amplification arm attached to said bouyant joining piece to move in combination therewith to thereby mechanically amplify the arcuate movement of said bouyant joining piece;

means for converting movement of said amplification arm into an indication of the quantity being measured; and

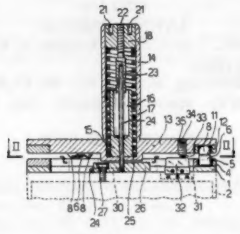
a fluid contained within said outer housing so as to completely encompass said movable block, said first vertical reed, said second vertical reed, said bouyant joining piece and said amplification arm, said fluid having a density sufficient to reduce the weight of said movable block, said first vertical reed, said second vertical reed, said bouyant joining piece and said amplification arm.

4,254,554

CONNECTION UNIT FOR MOUNTING A TOOL WITH PRECISION AND RELIABILITY ON A MACHINE, PARTICULARLY A MEASURING MACHINE

Francesco Germano, Turin, and Ugo Cavicchioli, Borgaro Torinese, both of Italy, assignors to Dea Digital Electronic Automation, S.p.A., Moncalieri, Italy

Filed Mar. 14, 1979, Ser. No. 20,595
Claims priority, application Italy, Mar. 23, 1978, 67643 A/78
Int. Cl.³ G01B 7/30
U.S. Cl. 33—174 L **22 Claims**



1. A connection unit for mounting a tool with precision and reliability on a machine, particularly a measuring machine, comprising first and second members which are adapted to be fixed respectively to said machine and said tool, mutual positioning means effective between said first and second members, and constraint means which comprise a substantially unextendable element locked at one end to one of said first and second members and resiliently constrained at the other end to the other of said first and second members, and which urge the first and second members together into relative positions determined by said mutual positioning means while allowing limited relative movement between said first and second members as a result of a displacement force exceeding a predetermined value and acting along directions and senses of movement allowed by said mutual positioning means.

4,254,555

PERSPECTIVE VIEW APPARATUS

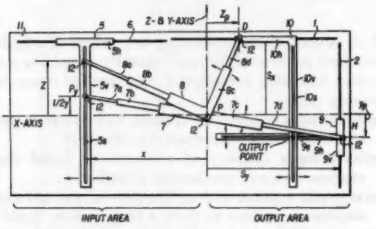
Emile E. Julian, P.O. Box 725, Laguna Beach, Calif. 92652

Filed May 11, 1979, Ser. No. 37,999
Int. Cl.³ B43L 13/14
U.S. Cl. 33—434 **14 Claims**

1. An apparatus for creating perspective views on a drafting table comprising:

(a) first horizontal guide means (1) mounted on the table;

(b) second horizontal guide means (6) mounted on the table;
(c) first vertical guide means (2,13) mounted on the table and perpendicular to the first horizontal guide means (1);
(d) a first member (5) perpendicularly connected to the second horizontal guide means (6) for movement along the second horizontal guide means (6) such that said first member (5) is perpendicular to the second horizontal guide means (6), said first member (5) providing an input;
(e) a second member (4,7) having a first end connected to the first member (5) for slideable movement along the first member (5), a second end connected to the first vertical guide means (2,13) for slideable movement along the first vertical guide means (2,13), and center portion interconnecting the first end and the second end of the second member (4,7);
(f) a third member (3,8) having a first leg and a second leg, the first leg having a first end connected to the first member (5) for slideable movement along the first member (5), and the first leg having a trace point fixed thereto, the



second leg having a second end connected to the first horizontal guide means (1) for slideable movement along the first horizontal guide means (1), the first and second legs intersecting at a viewpoint (P) and hingedly connected to said viewpoint (P) to the center portion of the second member (4,7) so that the trace point may be applied as a tracing input for the apparatus; and
(g) an output plotting means comprising a fourth member (10,19) perpendicularly connected to the first horizontal guide means (1) and connected to said second end of the third member (3,8), said fourth member (10,19) connected for movement along the first horizontal guide means (1) such that said fourth, member (10,19) is perpendicular to the first horizontal guide means (1) and parallel to the first vertical guide means (2,13), and means (9, 13–15) connected to the second half of the second member (4,7) in a fixed relationship with the vertical position of a point in a fixed relationship to the second end of the second member (4,7).

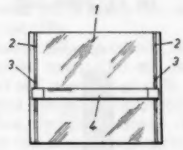
4,254,556

PORTABLE DRAFTING DEVICE FOR DRAWING PARALLEL LINES, COMPRISING A WORKING PLANE OF FLEXIBLE PLASTIC MATERIAL, ADAPTED TO BE ROLLED

Lello Anav, No. 35, Via Filippo Marchetti, Rome, Italy

Filed Apr. 25, 1979, Ser. No. 33,643
Claims priority, application Italy, May 3, 1978, 49187 A/78; Nov. 28, 1978, 52102 A/78
Int. Cl.³ B43L 5/00
U.S. Cl. 33—437 **7 Claims**

1. A portable drafting device for drawing parallel lines comprising in combination a rectangular board of a flexible plastic material, two upstanding lateral guides, one of said guides on each of the two short parallel sides of the rectangular board, a slider member having means adapted to engage and slide on one of said guides, a rule member, means for fastening one end of said rule member to said slider member to slide therewith on the engaged guide above said board while permitting pivoting of said rule member about said fastening means in a plane parallel with said rectangular board, for drawing parallel lines having any desired inclination, the assembly formed by said slider member and rule member being freely disengagable from one guide and engagable with the other guide to permit drawing parallel lines on the board portion adjacent said other



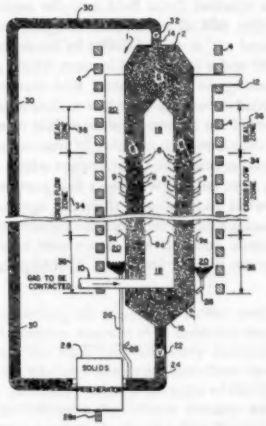
guide, each of said guides and said slider member having two parallel mutually engagable sliding elements to provide greater stability of said slider member when engaged with one of said guides, said board being adapted to be rolled around one of said guides to form a readily transportable roll.

4,254,557

MAGNETICALLY STABILIZED FLUID CROSS-FLOW CONTACTOR AND PROCESS FOR USING THE SAME

Francis X. Mayer; Martin O. Gernand, both of Baton Rouge, La., and Vincent Siminski, Rockaway, N.J., assignors to Exxon Research and Engineering Co., Florham Park, N.J.

Filed Jul. 31, 1979, Ser. No. 62,539
Int. Cl.³ F26B 3/34
U.S. Cl. 34—1 **19 Claims**



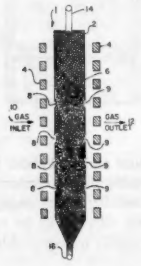
10. A process for contacting a gaseous fluid with a plurality of solid, discrete magnetizable particles comprising:
(a) continuously introducing and removing a bed of solid discrete magnetizable fluidizable particles in a porous chamber in a descending manner or direction,
(b) structuring and controlling the porosity in said bed by applying a magnetic field to said bed in a manner such that the magnetic field is substantially colinear with an external force field within said chamber; and
(c) passing a gaseous fluid through the magnetized particles with a velocity component substantially perpendicular to the external force field and the flow of particles and the applied magnetic field within said chamber.

4,254,558

LOUVERED MAGNETICALLY STABILIZED FLUID CROSS-FLOW CONTACTOR AND PROCESSES FOR USING THE SAME

Francis X. Mayer, Baton Rouge, La., assignor to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Jul. 31, 1979, Ser. No. 62,541
Int. Cl.[3] F26B *3/08*
U.S. Cl. 34—1 10 Claims



7. In a process for contacting a gaseous fluid with a plurality of solid, discrete magnetizable particles comprising:

(a) continuously introducing and removing a bed of solid, discrete magnetizable fluidizable particles in a porous chamber in a descending manner or direction

(b) structuring and controlling the porosity in said bed by applying a magnetic field to said bed in a manner such that the magnetic field is substantially colinear with the external force field within said chamber; and

(c) passing a gaseous fluid through the magnetized particles with a velocity component substantially perpendicular to the external force field and the applied magnetic field within said chamber, said magnetized particles are retained within said chamber by the action of said magnetic field and a plurality of louvers which are adjacent to the openings in the chamber, said louvers are arranged to extend outwardly from below their adjacent openings and toward the incoming gaseous fluid to support and expose to the chamber a plurality of free surfaces of said magnetized particles, the improvement which comprises: providing inlet louvers wherein a first portion of which extends upward and outward from the openings toward the incoming gaseous fluid and the balance, the second portion, extends outward and downward toward the incoming gaseous fluid to form a " " configuration.

4,254,559

METHOD FOR DRYING PIPELINES

Robert J. Purinton, Jr., Tulsa, Okla., assignor to The Dow Chemical Company, Midland, Mich.

Filed Feb. 19, 1980, Ser. No. 122,536
Int. Cl.[3] F26B *3/00*
U.S. Cl. 34—9 10 Claims

1. A method of drying the interior surface of a pipeline comprising sequentially passing through said pipeline:

(a) an aqueous cross-linked gelled pig,

(b) a fluid mobility buffer comprising a non-crosslinked gelled alkanol of from one to three carbon atoms, and

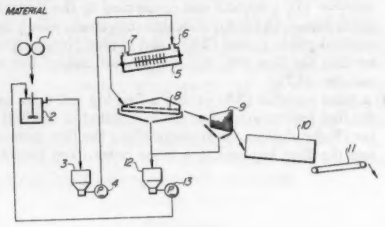
(c) a dessicating amount of a liquid alkanol of from one to three carbon atoms.

4,254,560

METHOD OF DRYING BROWN COAL

Minoru Tanaka, and Ryoji Harihara, both of Kitakyushu, Japan, assignors to Electric Power Development Co., Inc. and Nagata Seisakusho Co., Ltd., both of, Japan

Filed Apr. 27, 1979, Ser. No. 34,057
Claims priority, application Japan, Oct. 20, 1977, 52-126244
Int. Cl.[3] F26B *7/00*
U.S. Cl. 34—12 6 Claims



1. A method of manufacturing dry pellets of a hydrophilic brown coal material of the type naturally containing a quantity of water following exploitation, said method comprising the following steps:

introducing a quantity of crushed hydrophilic type brown coal material into a preparation chamber,

introducing a quantity of non-aqueous liquid dispersion medium into said preparation chamber;

mixing said crushed hydrophilic brown coal and said liquid dispersion medium to form a non-aqueous liquid admixture including hydrophilic brown coal particles dispersed throughout said non-aqueous liquid dispersion medium;

directly introducing said non-aqueous liquid admixture into a liquid phase pelletizing machine;

vigorously stirring and mixing only said non-aqueous liquid admixture, whereby said naturally contained water present within said hydrophilic brown coal particles at the time of exploitation is released and serves to automatically bind said coal particles into pellets, without additional binder being provided;

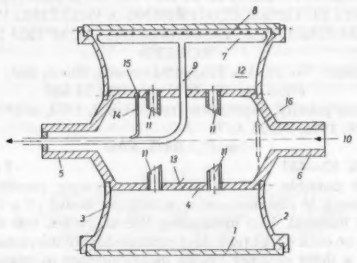
drying said resulting pellets of coal.

4,254,561

DRYING CYLINDER FOR A PAPER-MAKING MACHINE

Christian Schiel, Heidenheim, Fed. Rep. of Germany, assignor to J. M. Voith GmbH, Fed. Rep. of Germany

Filed Nov. 29, 1979, Ser. No. 98,341
Claims priority, application Fed. Rep. of Germany, Dec. 6, 1978, 2852731
Int. Cl.[3] F26B *13/18*
U.S. Cl. 34—124 12 Claims



1. A drying cylinder for use in a paper-making machine, comprising a cylinder barrel which is mounted on and which

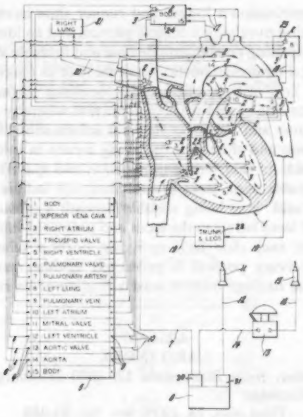
surrounds a hollow shaft; said cylinder barrel having an inner wall; said shaft having an inlet for steam; said shaft having outlet openings for passage of steam toward said inner wall of said cylinder barrel; said openings in said hollow shaft being provided with and defined by tubular components each of which has a free end projecting into the interior of said hollow shaft.

4,254,562

COMBINATION CARDIOVASCULAR ELECTRONIC DISPLAY/TEACHING APPARATUS, SYSTEM AND METHODS OF CONSTRUCTING AND UTILIZING SAME

David Murray, 18609 Greenlawn, Detroit, Mich. 48221

Filed Feb. 14, 1979, Ser. No. 12,070
Int. Cl.³ G09B *23/28, 7/10*
U.S. Cl. 434—267 **1 Claim**



1. A cardiovascular teaching apparatus for use by persons who can see as well as by persons who cannot see comprising:

a support member;

first means **(1, 21–24)** on said support member including a fixed representation of predetermined components of a cardiovascular system and other components of a living organism;

said first means **(1, 21–24)** being discernible by touch as well as visually;

second means **(4, 5, 9)** on said support member including fixed indicia components discernible by touch as well as visually for identifying said predetermined components of said cardiovascular system and said other components of said living organism;

illuminating means **(2)** and a first electrical terminal **(3)** on said support member in predetermined areas of said fixed representation of said predetermined components of said cardiovascular system and said other parts of said living organism;

said fixed indicia components **(5)** of said second means discernible by touch as well as visually being disposed in an ordered arrangement corresponding to the path of the flow of blood through said predetermined components of said cardiovascular system and said other parts of said living organism;

said second means including a second electrical terminal **(4)** and a third electrical terminal **(9)** discernible by touch as well as visually and being provided adjacent to and associated with each fixed indicium component making up said fixed indicia components discernible by touch as well as visually;

a plurality of first conductors **(10)** electrically interconnecting said first electrical terminals **(3)** with said third electrical terminals **(9)**;

a plurality of second electrical conductors **(6)** electrically interconnecting said illuminating means **(2)** with said second electrical terminals **(4)**;

an electrical power source **(8)** having a first electrical terminal **(30)** and a second electrical terminal **(31)**;

first probe means **(11)** electrically connected to said second electrical terminal **(31)** of said power source **(8)**;

second probe means **(15)**;

audible signal means **(13)** electrically connected between said second probe means **(15)** and said first electrical terminal **(30)** of said power source **(8)**;

a plurality of third electrical conductors electrically connecting said first electrical terminal **(30)** of said power source **(8)** with said illuminating means **(2)**;

whereby the illuminating means **(2)** in one of said areas will be energized when said first probe means **(11)** is brought into contact with the second electrical terminal of said second means which corresponds to the fixed indicium identifying such area in which the energized illuminating means **(2)** is located; and

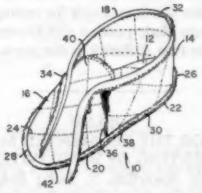
said audible signal means **(13)** will be activated when one of said first and second probe means **(11, 15)** is placed in contact with one of said third electrical terminals **(9)** of said second means, and the other of said first and second probe means **(15, 11)** is brought into contact with the particular one of said first electrical contacts **(3)** which is located in the predetermined area corresponding to the fixed indicium adjacent the particular third electrical terminal **(9)** which is in contact with said one of said first and second probe means **(11, 15)**.

4,254,563

FOOTWEAR AND METHOD OF MANUFACTURE THEREOF

Maria T. Bruno, 7243 S. Pebblecreek, West Bloomfield, Mich. 48033

Filed May 14, 1979, Ser. No. 38,474
Int. Cl.³ A43B *1/02*
U.S. Cl. 36—9 R **4 Claims**



1. Footwear comprising an inner sole in the outline of a human foot, a back member adapted to fit around a human heel and extending from the back approximately halfway to the front of the footwear having a flange portion about the bottom thereof extending outwardly toward the edge of the back part of the inner sole and having a top, a front member adapted to extend over the front portion of a human foot having a flange portion around the bottom thereof extending outwardly toward the edge of the front part of the inner sole of the footwear, each of said inner sole, back member and front member being constructed of three separate layers of jean material which are quilted together, a tie constructed of three separate layers of jean material folded over both sides of the top of the back member and extending outwardly of the front of the back member to provide ties for securing the footwear to a human ankle sewn to the top edge of the back member to provide six thicknesses of jean material in the tie member around the top of the back member and a rubber outer sole on the bottom of the inner sole sewn to the inner sole, back member and front member around the outer periphery of the inner sole and through

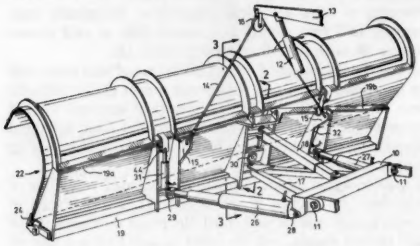
the flange portions of the back member and front member of the footwear, said jean material being frayed at all edges thereof to provide fringes on the footwear at all edges of the jean material.

4,254,564

REVERSIBLE SNOWPLOW ATTACHMENT

Albert Rath, Kitchener, Canada, assignor to C.E.P. Industries Limited, Toronto, Canada

Filed Aug. 30, 1979, Ser. No. 71,367
Int. Cl.³ E01H *5/00*
U.S. Cl. 37—42 VL **8 Claims**



1. In a snowplow having a forwardly mounted blade configured to scoop snow from the path of the snowplow and cast the snow laterally therefrom, the blade being angled to the forward direction so that during forward movement it scoops snow to slide upwardly and laterally across a front face of the blade towards its trailing end, the blade being pivotally mounted on the plow for pivotal movement about a vertical axis for reversing the direction in which the snow is cast, the improvement in which the blade is a composite structure comprising a lower scoop blade portion having a front face and a deflector portion having a front face positioned to receive snow lifted and sliding along said scoop blade portion, the deflector portion being pivotally mounted on said blade for movement about an axis substantially perpendicular to the front face of the scoop blade portion and tiltable relative to the scoop blade portion about said axis for raising either end with respect to the scoop blade portion and lowering the other end to provide a blade that is flared in the snow discharge direction.

4,254,565

METHOD FOR THE SEGMENTED MINING AND DRYING OF BENTONITE

Jerold D. Jenkins, Spearfish, S. Dak.; Robert A. Falconer, Birmingham, and Donald A. Hentz, Farmington Hills, both of Mich., assignors to International Minerals & Chemical Corp., Terre Haute, Ind.

Continuation of Ser. No. 949,488, Oct. 10, 1978, abandoned, which is a continuation-in-part of Ser. No. 791,260, Apr. 27, 1977, abandoned. This application Nov. 8, 1979, Ser. No. 92,600
Int. Cl.³ E02F *1/00*
U.S. Cl. 37—195 **4 Claims**

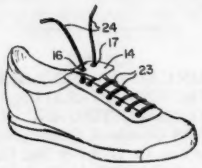
1. An improved method for mining of bentonite clay having a moisture content of 25–32%, the steps comprising tilling an exposed bentonite clay deposit to a uniform depth of not more than about eight inches, drying and curing the tilled bentonite in situ by exposure to sun and air until said tilled bentonite reaches a uniform moisture level of not more than about 18%, removing only the dried and cured tilled bentonite, thereby exposing the bentonite therebelow, tilling the exposed layer of bentonite to a uniform depth of not more than about eight inches to promote drying and curing and thereafter repeating the removal, tilling, in situ drying and curing steps to obtain a bentonite clay having a uniform particle size and uniform moisture level not more than about 18%.

4,254,566

JOGGER AND RUNNER SHOE IDENTIFICATION

Sylvan K. Haskell, 624 Ellsworth Pl., Pittsburgh, Pa. 15232

Filed Apr. 19, 1979, Ser. No. 31,581
Int. Cl.³ A44C *3/00*
U.S. Cl. 40—2 E **7 Claims**



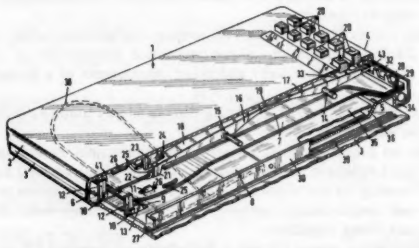
1. In combination a jogger and runner shoe having a front laced opening overlying a tongue portion and an identification device comprising an elongate flexible and foldable sheet member having a weakened portion intermediate its length defining a bending line, at least one indicia receiving surface on said sheet on one side of said weakened portion whereby a wearer's name, address and pertinent medical information may be applied thereon and shoe lace receiving means in said sheet on the other side of said weakened portion and spaced from one end engageable upon laces of said shoe, the indicia receiving surface of said sheet being slidable beneath a substantial portion of said laces between the laces and tongue of said shoe and overlaid by said shoe lace receiving portion whereby said indicia receiving portion is protected against unauthorized removal and damage over at least a portion of its surface.

4,254,567

CARD INDEX

Walter Koller, Beim Riesenstein 12, 2000 Hamburg 65, Fed. Rep. of Germany

Filed Nov. 13, 1979, Ser. No. 93,043
Int. Cl.³ B42F *17/18*
U.S. Cl. 40—389 **9 Claims**



1. In a card index comprising a housing, a drawer slidably mounted in said housing, a stack of index cards in said drawer, spring means biassing said drawer to an open position from said housing, catch means holding said drawer closed in said housing, said index cards having punched selection holes and punched retaining dog holes, a plurality of selection key levers movably mounted in said housing, a stop cam for engagement in said selection holes on each of said key levers, means associated with key levers to release said catch means and allow said drawer to open when anyone of said key levers is operated, said stop cams being arranged to engage selectively in said selection holes whereby a selected card is allowed to move in said drawer on top of said stack out of said housing when a selected one of said key levers is operated, and dog means in said drawer engaging in said dog holes of said cards to move some of said cards with said drawer out of said housing as said

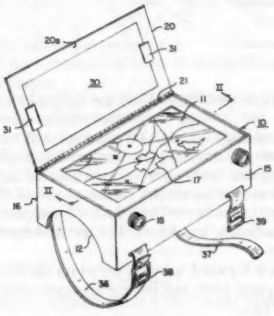
drawer opens, the improvement wherein said dog means comprise a row of dogs, means locating said stop cams closely adjacent said dogs, said key levers being arranged to move said stop cams into a range of movement of said dogs, and means defining inclined front edges on said dogs facing in the direction in which said drawer opens from said housing, said inclined front edges being operative to deflect cards which, in use, have their selection holes engaged by one of said stop cams upwards away from the bottom of said drawer and off said dogs, and all of said index cards having selection holes which register with every stop cam except one stop cam so that when said one stop cam is moved by its key lever said card which does not have a selection hole in register with said one stop cam is held down by said stop cam on said dogs and is moved by said spring means from said housing.

4,254,568

AERIAL NAVIGATION INSTRUMENTS

Alfonso Ranalli, 5409 William Flynn Hwy., Gibsonia, Pa. 15044

Filed Oct. 11, 1979, Ser. No. 83,765
Int. Cl.³ G09F *11/18*
U.S. Cl. 40—518 **4 Claims**



1. An aerial navigation instrument comprising a housing having a window therein, a pair of rollers in said housing, one at each end of the window, a continuous aeronautical chart of a desired route of travel on said rollers, means for rotating said rollers whereby said aeronautical chart is moved from one roller to the other in front of said window and a plate means hinged along one side of said housing and adapted to pivot between a first position generally in the plane of said window in the housing and alongside thereof, stop means on one of said plate means and housing engaging between said plate means and housing to hold said plate means in said first position alongside said window to form a jointly substantially planar surface and a second position overlying said window, said plate having a second window portion exposed in said second position and carrying an outline of approach procedure and control for a destination airport, said hinged plate means having a first face exposed in said first position removably holding a writing surface and a second face carrying said second window portion, and an arcuate surface on said housing opposite said window adapted to rest on the leg of a user and having leg engaging means thereon.

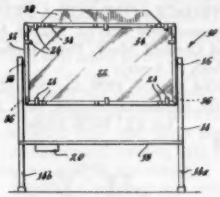
4,254,569

BULLETIN DISPLAY BOARD

Carl L. Janik, P.O. Box 731, Sedona, Ariz. 86336

Filed Nov. 13, 1978, Ser. No. 959,854
Int. Cl.³ G09F *15/00*
U.S. Cl. 40—606 **7 Claims**

1. A display device assembly having a display board for messages and bulletins comprising a support stand, means pivotally mounting said display board on said support stand whereby said display board can selectively assume substantially vertical and horizontal positions, said display board having a peripheral frame for said display board having a surface projecting above the plane of said display board, a tray-like transparency, a plurality of releasable clips on said frame for holding said transparency on said display board



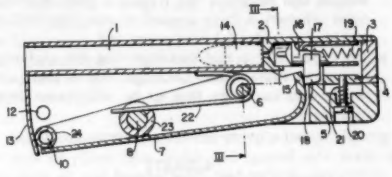
within the confines of said projecting surface of said frame and with said messages and bulletins therebetween, and at least one permanent magnet on a lower corner of said frame, and said support stand being provided with at least one magnetically attracted leg whereby when said display board is in its vertical position said board is maintained in that position by magnetic forces.

4,254,570

DOUBLE BARRELLED FIREARM

Juan Uriarte del Rio, 78-Calle Bristol, and Jose Jimenez-Alfaro, 33-Avda. Brasilia, both of Madrid 28, Spain

Filed Oct. 23, 1978, Ser. No. 953,496
Claims priority, application Spain, Oct. 22, 1977, 463.479; Fed. Rep. of Germany, Mar. 27, 1978, 2811760
Int. Cl.³ F41C *3/00*
U.S. Cl. 42—2 **5 Claims**



1. A double barrel firearm comprising:
first and second parallel barrels having attached thereto a casing including a pair of parallel spaced arms;
a firing lever pivotable about a bearing extending between said spaced arms from a first non-firing position to second firing positions successively inwardly of said casing;
a bolt slidably mounted on said casing at a location rearwardly of said barrels;
said bolt having first and second firing pins aligned with said first and second barrels, respectively;
said first and second firing pins having extending therefrom respective first and second stops of different lengths;
means for urging said first and second firing pins toward said first and second barrels, respectively;
said firing lever having a first end having guard means for, when said firing lever is in said first non-firing position, acting on said first and second stops to maintain said first and second firing pins spaced from said first and second barrels, respectively, against the force of said urging means, and for, when said firing lever is sequentially moved to said second firing positions, sequentially releasing said first and second stops and thereby allowing said urging means to sequentially drive said first and second firing pins toward said first and second barrels, respectively;
lock means for locking said bolt to said casing; and

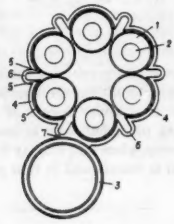
safety stop means in said firing lever for selectively preventing said firing lever from being moved from said first non-firing position thereof to said second firing positions thereof.

4,254,571

CARTRIDGE LOAD FOR A REVOLVER

Kurt Peter, Donaustrasse 101/12, A-2344 Maria Enzersdorf, Südstadt, and Gerhard Muck, Peter-Jordan-Strasse 159, A-1180 Wien, both of Austria

Filed Jun. 26, 1979, Ser. No. 52,318
Claims priority, application Austria, Nov. 29, 1978, 8543/78
Int. Cl.³ F42B *39/04*
U.S. Cl. 42—89 **13 Claims**



1. A load package for a cylinder of a revolver, said cylinder having angularly equispaced bores adapted to receive respective cartridges, said package comprising:

an array of angularly spaced cartridges corresponding in number to said bores;

a circumferentially closed cartridge ring injection-molded onto said cartridges and formed with a plurality of angularly equispaced seats each receiving one of said cartridges, said cartridge ring having at least one weakened point whereby a force applied to said ring will rupture said ring at said weakened point; and

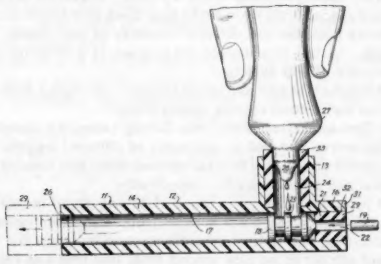
a grip connected to said cartridge ring for applying force thereto to rupture said cartridge ring at said point and enable said cartridge ring to be withdrawn from said cartridges.

4,254,572

LUBRICATOR-LOADER FOR FIREARMS

Henry R. Nelson, R.D. #2, Box 66, Lambertville, N.J. 08530

Filed May 18, 1979, Ser. No. 40,602
Int. Cl.³ F41C *27/00*
U.S. Cl. 42—90 **6 Claims**



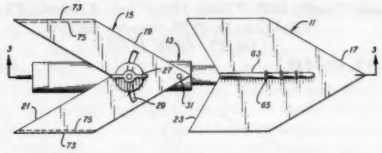
1. Simple lubricator-loader for lubrication and insertion of bullets into the muzzle of a firearm, comprising a main arm and a side arm, said side arm dividing said main arm into a first portion and a second portion, said first portion of said main arm having a cylindrical bore for receiving slidably a bullet of selected diameter, said side arm having a bore for introduction of lubricant and transfer of said lubricant therethrough to the sidewall of said bullet, said second portion having a cylindrical bore of diameter reduced below that of said first portion for receiving slidably a ramrod of diameter smaller than that of said bullet, said second portion including a shoulder for positioning a bullet inserted into said first portion in registry with the bore of said side arm, at least one of said first portion and second portion being long enough to be readily grasped for holding the free end of said main arm of said lubricator-loader against the muzzle of a firearm during a loading operation.

4,254,573

TROLLING DEVICE

Steven Mastropaolo, c/o Cacioppo, 242 Loop Dr., Sayville, N.Y. 11782

Filed Apr. 25, 1979, Ser. No. 33,308
Int. Cl.³ A01K *97/00*
U.S. Cl. 43—43.13 **10 Claims**



1. A trolling device for oscillating a fishing lure when towed in the water, said trolling device comprising:

an elongated body having a forward end and a rearward end with a pair of compartments located longitudinally within the elongated body, one of said pair of compartments being located adjacent the rearward end of the elongated body and the other of said pair of compartments being located adjacent and forward of the first-mentioned compartment;

a swept-back forward wing mounted on the forward end of the elongated body and having an aspect ratio of between one and two;

a swept-back rearward wing mounted on the elongated body at the rearward end;

spheres rollably located within each of said pair of compartments; and

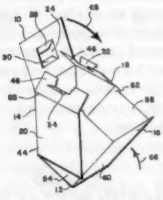
means on said elongated body for connection thereto to a trolling line.

4,254,574

HOLLOW FORM, POLYHEDRON BLOCK ELEMENT FORMED OF SHEET MATERIAL

Robert Stock, 12311 Buaro, Garden Grove, Calif. 92640

Filed Feb. 12, 1979, Ser. No. 11,386
Int. Cl.³ A63H *33/08, 33/00*
U.S. Cl. 46—25 **7 Claims**



1. A modular constructional block element formed from a foldable blank comprising a hollow-form polyhedron with a bottom wall having at least one centrally located polygonal aperture, back and front side walls, each foldably attached at one edge to an edge of said bottom wall and a full width top wall foldably attached at one edge to the upper edge of one of

said back and front walls, a pair of side walls, each foldably attached at one edge to the edge of said front wall, a pair of half width top walls, each attached at one edge to the upper edge of a respective side wall and foldable to underlie said top wall, a first pair of foldable tabs centrally located in said top wall to form a second aperture therein and a second pair of foldable tabs, one each in one of said half width top walls located to be received in said second aperture of said full width top wall and to coact with said first pair of foldable tabs to form a raised rim about said second aperture whereby said polygonal aperture and second aperture with said raised rim define coacting, block interconnecting means and block element retention means.

4,254,575

ILLUMINATED FLYING SAUCER-LIKE TOYS

Arnold S. Gould, 17 Oakland St., Lexington, Mass. 02173

Continuation of Ser. No. 803,222, Jun. 3, 1977, abandoned. This application Feb. 12, 1979, Ser. No. 11,550

Int. Cl.³ A63H *27/00*

U.S. Cl. 46—74 D **8 Claims**

1. An aerodynamic toy comprising,

a saucer-shaped translucent body of predetermined circumferential length,

said body having a rim at the periphery thereof defining an annular cavity, and

a flexible tubular member containing chemical means for producing light bent into a ring and inserted in said cavity, said tubular member being resilient and having a predetermined diameter and a length corresponding to said circumferential length such that said ring fits tightly within said cavity.

4,254,576

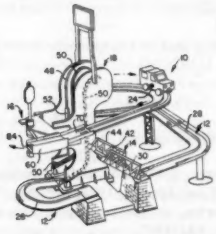
SPIN TOWER STATION FOR USE WITH TOY VEHICLE AND TRACKWAY

Hajime Matsumoto, Chiba, and Toshio Suzuki, Tokyo, both of Japan, assignors to Toybox Corporation, Japan

Filed Apr. 18, 1979, Ser. No. 31,139

Int. Cl.³ A63H *19/10*

U.S. Cl. 46—216 **17 Claims**



1. An amusement device, comprising:

a vehicle provided with wheels freely mounted for rotation, first driven gears mounted for rotation, and a second stationary gear mounted concentrically with respect to one of said first gears; and

a trackway against which said wheels of said vehicle rest, said trackway being provided with guide means for directing said vehicle therealong and including:

a somersault tower station having an entry port positioned below and exit port, said somersault tower station including upstanding side portions provided with first continuous racks of teeth positioned to be engaged by said first driven gears of said vehicle to propel said vehicle upwardly along said side portions of said tower station, one of said side portions also being provided with a second rack of teeth spaced apart from said first rack and positioned to be engaged by said second stationary gear of said vehicle to cause said vehicle to rotate about said second gear simultaneously while moving upwardly along said side portions of said tower,

a spin tower station having an entry port positioned above an exit port, said spin tower station including a platform with parallel rails having racks of teeth thereon positioned to engage said first driven gears of said vehicle, and first means mounting said platform for moving said platform downward from said entry port to said exit port while simultaneously rotating said platform about the axis of the downward movement,

second means for conveying said toy vehicle from said exit port of said spin tower station to said entry port of said somersault tower station, and

third means for conveying said toy vehicle from said exit port of said somersault tower station to said entry port of said spin tower station.

4,254,577

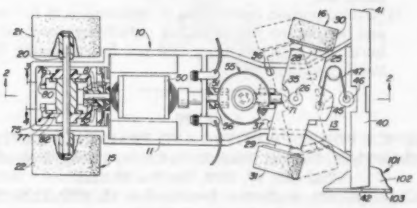
MODEL VEHICLE

Richard C. M. Cheng, Suite 1604, Austin Center, Austin Ave., Kowloon, Hong Kong

Filed Feb. 2, 1978, Ser. No. 874,388

Int. Cl.³ A63H *17/36;* **A63F** *9/14;* **F16D** *13/04, 41/04*

U.S. Cl. 46—258 **7 Claims**



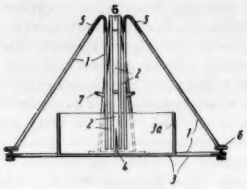
1. A model vehicle for movement along a trough having a bottom wall of plural lane width and spaced side walls on opposite sides of said bottom wall, said vehicle comprising a chassis, wheeled running gear on said chassis for rolling engagement with the trough bottom wall, rotary motive means carried by and having a housing fixed relative to said chassis for remote actuation in opposite angular directions, clutch means in driving relation between said motive means and running gear, said clutch means being operative to drive said running gear in forward direction upon actuation of said motive means in both of said opposite angular directions, steering gear associated with said running gear for steering the latter in opposite lateral directions toward respective trough side walls, and steering gear operating means interposed between said motive means and steering gear for operating the latter in opposite lateral directions upon motive means operation in opposite angular directions, said steering gear operating means comprising a pinion mounted for simultaneous axial rotation and back and forth movement to shift said steering gear, a rotary drive gear in meshing engagement with said pinion on one side, and a fixed gear in meshing engagement with said pinion on the other side for moving said pinion back and forth along said fixed gear upon rotation by said drive gear, said fixed gear being interrupted at opposite ends for back and forth pivotal movement beyond said fixed gear to overrun the latter without jamming, whereby said running gear operates in forward direction and is steered in opposite lateral directions by remote motive means actuation for desired vehicle lane change and movement along a selected trough side wall.

4,254,578

TREE STAND

Franzhermann Hanfeld, Am Teeberg 90,, D-3111 Gerdau, Fed. Rep. of Germany

Filed May 8, 1978, Ser. No. 903,674
Int. Cl.[3] A47G 7/02
U.S. Cl. 47—40.5 10 Claims



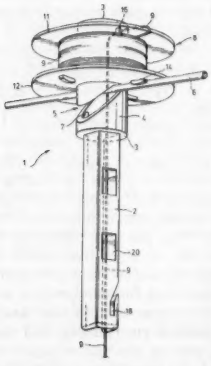
1. A tree stand comprising
(a) a pot; and
(b) a plurality of resilient bars each having
(1) a bend;
(2) a resilient first portion extending substantially vertically downwardly from said bend and terminating in a free end; the first portions of said bars extending substantially parallel to one another and being arranged in a circular array for forming together a generally cylindrical vertical shaft for receiving the trunk of a tree and holding the same by a resilient clamping force;
(3) a resilient second portion extending from said bend obliquely downwardly and away from said shaft and being affixed to said pot at a location remote from said bend; and
(4) a third portion constituting a continuation of the second bar portion and extending radially outwardly in a horizontal direction from said pot for increasing the stability of the stand.

4,254,579

DEVICE FOR SUPPORTING AND TRAINING PLANTS

Richard Flynn, Convent Road, Rush, County Dublin, Ireland

Filed Oct. 17, 1978, Ser. No. 952,255
Claims priority, application Ireland, Oct. 18, 1977, 2129/77
Int. Cl.[3] A01G 17/08
U.S. Cl. 47—46 10 Claims



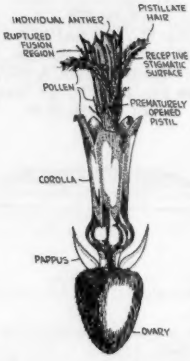
1. A plant layering device comprising a body portion which has a hook portion which is adapted to grip a horizontal support wire mounted above and substantially parallel to a crop row such that the body portion is slidable along the horizontal wire, and in combination therewith a spool which is rotatable about the body portion and which is adapted to carry and pay out a plant support cord as the body portion is moved along the support wire such that the stem of the plant is layered along the plant row, and means responsive to downward pressure on the spool to retard rotation of the spool.

4,254,580

PRODUCTION OF SUNFLOWER SEEDS IN INCREASED YIELDS

David B. Ferguson, Fresno, Calif., assignor to David & Sons, Inc., Fresno, Calif.

Filed Oct. 23, 1978, Ser. No. 953,786
Int. Cl.[3] A01H 1/02
U.S. Cl. 47—58 17 Claims



1. A process for the production of sunflower seeds in increased yields comprising:
(a) planting in a growing area a plurality of seeds capable of forming *Helianthus annuus* sunflower plants which are physiologically self-compatible and possess homozygous f genes, said planting being carried out in the substantial absence of seeds capable of forming *Helianthus annuus* sunflower plants which are physiologically self-incompatible and/or lack homozygous f genes, whereby said seeds germinate to form sunflower plants, and seeds are formed on said sunflower plants as a result of self-pollination, said f genes having the ability to facilitate the formation of parenchyma cells between floret anthers which allow the anthers to become substantially non-fused following pollen dehiscence thereby making possible a greater degree of self-pollination with concomitant increased seed formation, and
(b) harvesting said resulting seeds formed on said sunflower plants.

4,254,581

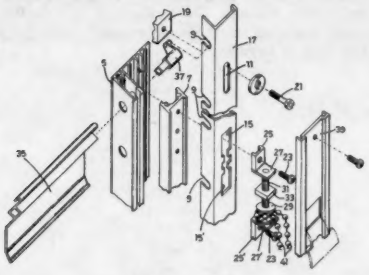
LOUVER SHUTTER WITH MOVABLE LOUVER BOARDS

Norisue Ishihara, 1941 Jindaiji-cho, Chofu-shi, Tokyo, Japan

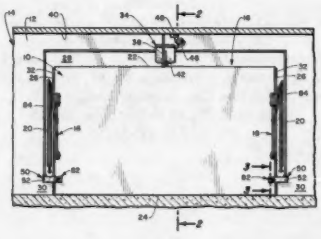
Filed Jun. 22, 1978, Ser. No. 918,162
Claims priority, application Japan, Jun. 22, 1977, 52/74593; Feb. 28, 1978, 53/21547
Int. Cl.[3] E06B 7/086, 7/09
U.S. Cl. 49—82 4 Claims

1. A louver shutter comprising,
a plurality of louver boards, each of said louver boards having a shaft at one end and a crank shaft at the other end;
a first frame receiving each of said crank shafts;
a second frame mounted so as to be slidably movable with respect to said first frame and operatively engaging said crank shafts so as to open or close said louver boards in response to selected sliding movement of said second frame in either a first direction or a second direction;

an engaging hole formed in said second frame;
a rotatable drive member operatively associated with said second frame; and
means disposed within said engaging hole to engage said second frame, and mounted on said rotatable drive member so as to be selectably moved in said first or second directions in response to rotation of said drive member, so that the movement of said means imparts sliding movement of said second frame and thereby opens or closes said louver boards.

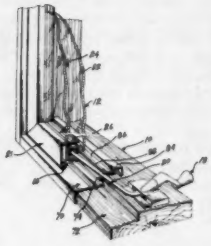


4,254,582
ELECTRICALLY ACTUATED OVERHEAD GARAGE DOOR OPENER ASSEMBLY
Michael H. McGee, 2334 Clement Ave., Venice, Calif. 90291
Filed Jul. 25, 1979, Ser. No. 60,636
Int. Cl.³ E05F *11/00, 15/00*
U.S. Cl. 49—199 **22 Claims**



1. In an electrically actuated overhead garage door opener assembly of the type selectively actionable for moving a garage door between a generally vertical closed position received in a door frame and a generally vertically and rearwardly raised open position providing an access opening through said door frame, there being clearance openings between sides of said door and sides of said door frame when said door is in said closed position; the improvements comprising: an electrically actuated solenoid secured interiorly on a side of said door frame and having housing means projecting transversely from said door frame side across said clearance opening and transversely interiorly overlapping and adjacent of said door sides when said door is in said closed position, said solenoid housing means being positioned on said door frame side free of interference with said door during said door movement between said open and closed positions, a solenoid plunger normally resiliently urged to extended position projecting transversely from said solenoid housing means when said solenoid is not electrically actuated and movable to a withdrawn position relative to said housing means when said solenoid is electrically actuated; a latch member interiorly secured to said door transversely aligned and transversely receiving said solenoid plunger therein when said door is in said closed position and said solenoid plunger is in said extended position preventing movement of said door from said closed position, electrical actuation of said solenoid moving said solenoid plunger to withdrawn position free of latch member reception permitting door movement from and into said door closed position; electric power supply means operably connected to said solenoid for electrically actuating said solenoid during door movement from and into said door closed position; whereby, said solenoid plunger locks said door in door closed position when said solenoid is not electrically actuated while said solenoid case guards said clearance opening between sides of said door and frame and positions said solenoid plunger transversely displaced from said clearance opening less subject to unauthorized manipulation.

4,254,583
WINDOW UNIT
Denis L. Smits, St-Hilaire, and Helmut Schmidt, Otterburn Park, both of Canada, assignors to Superseal Corporation, St. Hyacinthe, Canada
Filed Sep. 22, 1975, Ser. No. 615,370
Int. Cl.³ E05D *15/28*
U.S. Cl. 49—246 **7 Claims**



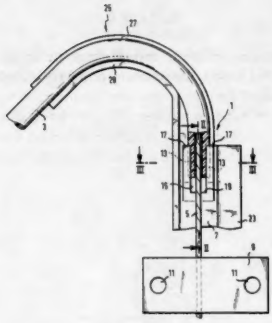
1. A casement window assembly comprising: a window frame; a sealed double glazed window unit comprising:
(a) a pair of glass sheets arranged in spaced parallel relationship to form an air space therebetween;
(b) a spacing unit disposed between the inner marginal edges of the glass sheets and extending completely around the periphery thereof to maintain the sheets in space relationship;
(c) a border formed of interconnected elements made entirely of vinyl plastics and extending completely around the periphery of said glass sheets, each said border element having a cross-section including a web portion and a pair of leg portions projecting from one face of said web portion and surrounding the outer marginal edges of the glass sheets; each said border element including a first enclosed hollow portion extending from the opposite face of said web portion and defining a first insulation chamber; said chamber including opposite front and rear walls; the rear wall of one of said border elements having a longitudinally extending opening therethrough;
(d) a reinforcing member received at least in each chamber of two opposite border elements; said two border elements including the border element having said opening therethrough;
(e) a manual operator means mounted on said window frame and having one arm extending through said opening; said arm having one extremity slidably mounted to the reinforcing member received in the associated border element; and
(f) hinge means mounted to said window unit and to said window frame for pivotably mounting said window unit to said frame.

4,254,584

OPERATING MECHANISM FOR A MOTORCAR WINDOW

Peter Hess, Coburg, Fed. Rep. of Germany, assignor to Metallwerk Max Brose GmbH, Coburg, Fed. Rep. of Germany

Continuation of Ser. No. 854,138, Nov. 23, 1977, Pat. No. 4,201,014. This application Aug. 31, 1979, Ser. No. 71,543
Claims priority, application Fed. Rep. of Germany, Dec. 13, 1976, 2656428
Int. Cl.[3] E05F *11/48*
U.S. Cl. 49—325 6 Claims



1. In a window operating mechanism including a window carrier movable in a predetermined path, a driving device, an elongated bowden cable including a tension member and a compression member, said tension member drivingly connecting said carrier and said device, and said compression member being formed with a longitudinal bore therethrough receiving said tension member, and retaining means associated with respective, longitudinally terminal portions of said compression member adjacent said carrier and said device respectively for abuttingly retaining the associated portions, the improvement which comprises:

(a) said compression member being an axially tubular member formed of a flexible plastic material, and at least one of said longitudinally terminal portions of said flexible tubular member being integral therewith and formed with two diametrically opposed longitudinal grooves having bottoms and extending inwardly from the outside surface of said tubular member without penetrating the tubular member so that each of the grooves has a bottom spaced from the inside surface of said tubular member and

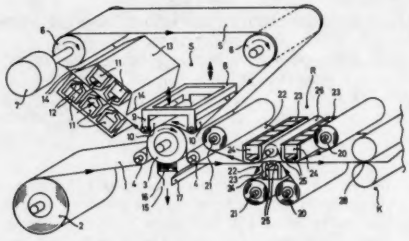
(b) the retaining means associated with said one portion including a fixedly positioned plate-shaped retaining member formed with an elongated slot bounded by two edge portions extending in the elongated direction of said slot, the spacing between said edge portions being substantially equal to the spacing between the bottoms of said grooves, said edge portions being received in form-fitting engagement with said grooves respectively and thereby preventing angular movement of said one terminal portion about the axis longitudinal of said bowden cable, the length of said edge portions forming said slot being at least equal to the length of said grooves in the axial direction of said tubular member.

4,254,585

PROCESS AND APPARATUS FOR THE SURFACE TREATMENT OF FLEXIBLE MAGNETIC RECORDING MEDIA

Klaus Schoettle, Heidelberg; Wulf Muenzner, Frankenthal; Hilmar Lechner, Ludwigshafen; Dieter Woeppel, Waldsee, and Lothar Gliniorz, Frankenthal, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Jan. 16, 1979, Ser. No. 3,947
Int. Cl.[3] B24B *21/04*
U.S. Cl. 51—5 A 6 Claims



1. In the manufacture of magnetic media in the form of a web of base material coated with the recording layer, a process for the surface treatment of the coated web, comprising in this order, the steps of:

burnishing the magnetic coating;

freeing the magnetic coating from abrasive dust; and

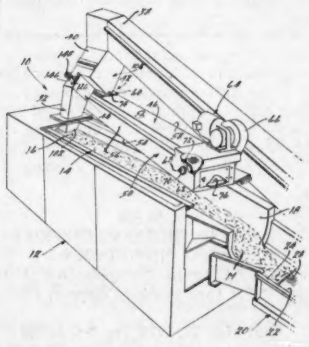
passing the coated web through a calender having at least one nip.

4,254,586

TIME CYCLE CONTROL SYSTEM FOR VIBRATORY FINISHING MACHINES

Gordon H. Anderson; David R. Nelson, both of Albert Lea, and Richard T. Fetterly, Faribault, all of Minn., assignors to King-Seeley Thermos Co., Prospect Heights, Ill.

Filed Mar. 30, 1979, Ser. No. 25,325
Int. Cl.[3] B24B *31/06*
U.S. Cl. 51—163.1 5 Claims



1. In combination with a vibratory finishing machine having a finishing chamber provided with an inlet portion and an outlet portion and a finishing media supply means,

said supply means comprising a return conveyor having inlet and outlet portions for returning media from said outlet portion of said finishing chamber to said inlet portion thereof,

means for receiving media from said supply means and for

selectively proportioning the same to said inlet and outlet portions of said finishing chamber, and

said last mentioned means including

(a) a secondary conveyor means having inlet and outlet portions for delivering media from said outlet portion of said return conveyor means toward a position adjacent said outlet portion of said finishing chamber, and

(b) means for receiving media from said return conveyor, and first and second delivery means for deliverying media to said inlet portion of said finishing chamber and to said inlet portion of said secondary conveyor, respectively.

4,254,587

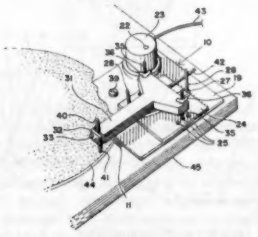
PIVOTAL WORK HOLDING DEVICE FOR GRINDING GEMSTONES

Hugh R. Wilson, 10840 SW. 120th St., Miami, Fla. 33176

Filed Dec. 17, 1979, Ser. No. 104,679

Int. Cl.³ B24B 9/16

U.S. Cl. 51—229 **5 Claims**



1. A work holding device for grinding gemstones and industrial diamonds comprising:

stationary base means for stationary mounting adjacent to a moving abrasive surface,

movable base means pivotally mounted on said stationary base means for pivotal movement thereon,

retaining means mounted on said movable base means for receiving and retaining dop holding means, said dop holding means having supporting structure extending downwardly to engage said retaining means and removably held by said retaining means said dop holding means holding a stone bearing dop in contact with an abrading surface,

motive power means for powered movement of said movable base means and said dop holding means,

eccentric crank and slide means connecting said motive power means and said movable base means to said stationary base means for transmitting powered movement to said movable base means, said movement causing said stone bearing dop to move across said abrading surface in a reciprocating arcuate path for the grinding of said stone.

4,254,588

METHOD OF CONTROLLING INFEED IN THE COMPOUND GRINDING

Makoto Onoda, and Kazuyoshi Nakajima, both of Iwata, Japan, assignors to NTN Toyo Bearing Company, Limited, Osaka, Japan

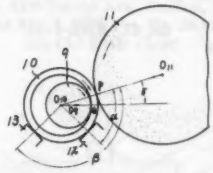
Filed Mar. 22, 1979, Ser. No. 22,988

Claims priority, application Japan, Mar. 22, 1978, 53/33336

Int. Cl.³ B24B 1/00, 5/12

U.S. Cl. 51—291 **7 Claims**

1. A method of controlling infeed in compound grinding for simultaneously grinding the inner and outer diameters of an annular workpiece with a multiple infeed speed, comprising the steps of starting the simultaneous rough grinding of the inner and outer diameters at rough grinding infeed speeds so determined as to simultaneously reach predetermined allowances for precision grinding, completing the rough grinding of the inner diameter in response to a signal indicating the completion of the rough grinding of the outer diameter, and simultaneously starting precision grinding at precision grinding infeed speeds such that when the precision grinding of one of said inner or outer diameter is completed, the other of said inner or outer diameter has a remaining predetermined allowance for precision grinding, monitoring the inner and outer diameters and adjusting the starting point for precision grinding of the other of said inner or outer diameter when the other of said inner or outer diameter will not have the remaining predetermined allowance for precision grinding upon completion of the precision grinding of the one of said inner or outer diameter.



4,254,589

BELT REFURBISHING

Walter H. Hunt, IV, and Lynn W. Craig, both of Louisville, Ky., assignors to Rohm and Haas Company, Philadelphia, Pa.

Filed Nov. 22, 1978, Ser. No. 962,826

Int. Cl.³ B24B 1/00

U.S. Cl. 51—318 **14 Claims**

1. A process for refurbishing the surface of a steel belt having a mirrored surface which has excessive optical distortion and a distorted back surface comprising grinding the back surface of the belt across its width with a rotating motion parallel to said back surface until no further distortion can be removed from the back of the belt, grinding the mirrored surface of the belt across its width with a rotating motion parallel to said mirrored surface until said surface is uniformly dull, polishing the dulled surface to a mirrored finish while supporting the back surface under the area of dulled surface being polished and cooling the belt during said grinding and polishing.

4,254,590

METHOD FOR THE PRODUCTION OF A DISK-SHAPED SILICON SEMICONDUCTOR COMPONENT WITH NEGATIVE BEVELING

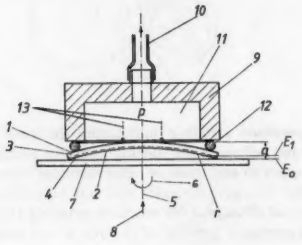
Dieter Eisele, Lampertheim; Jürgen Pape, and Armin Hochhut, both of Bürstadt, all of Fed. Rep. of Germany, assignors to BBC Brown Boveri & Company Limited, Baden, Switzerland

Filed Sep. 10, 1979, Ser. No. 73,791

Claims priority, application Fed. Rep. of Germany, Nov. 13, 1978, 2849184

Int. Cl.[3] B24B *1/00*

U.S. Cl. 51—324 3 Claims



1. A method for the production of a disk-shaped silicon semi-conductor component with at least two adjoining zones of opposite type conductivity and different doping strengths using a lapping disk which comprises:

positioning the semiconductor disk adjacent the lapping disk;

subjecting the semiconductor disk to a suction pressure on its side opposite the lapping disk so as to be bowed up from an initial lapping plane with a radius of curvature corresponding to a desired angle;

rotating said lapping disk;

lapping said semiconductor disk with said rotating lapping disk at a shallow angle of orientation such that the cross section of the semiconductor disk is smaller on the more highly doped side than on the side with lower doping; and

beveling off the bounding surface of the semiconductor disk opposite the plane of the junction separating the two zones into the region of the junction separating the two zones.

4,254,591

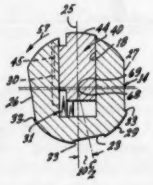
INTERNAL LAPPING TOOL

Julius P. Sedgwick, 15911 Marigold Ave., Gardena, Calif. 90249, and Lindy Helms, 12103 Gard Ave., Norwalk, Calif. 90650

Filed Jun. 28, 1979, Ser. No. 53,288

Int. Cl.[3] B24B *33/02*

U.S. Cl. 51—355 12 Claims



1. An internal lapping tool comprising:

a mandrel;

a generally cylindrical head made of a relatively soft metal attached on the end of said mandrel;

said head having two spaced raised arcuate lapping faces formed on the periphery thereof, said lapping faces and said head formed as a single continuous element;

an insert made of the same metal as said head carried in a slot on said head substantially diametrically opposite the midpoint between said two spaced arcuate lapping faces;

said insert having an arcuate lapping face integrally formed on the periphery thereof; and

adjusting means for radially adjusting said insert to force and maintain said three arcuate lapping faces to have a close fit against the wall of a hole to be lapped as the arcuate lapping faces wear and the hole is enlarged.

4,254,592

BARREL-TYPE SHOT BLASTING MACHINE

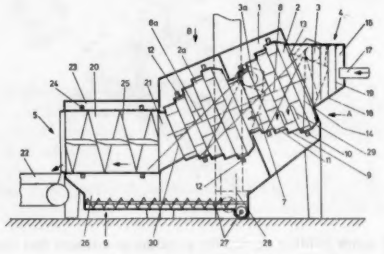
Emil Berna, and Sergej Toedtli, both of Schaffhausen, Switzerland, assignors to Georg Fischer AG, Switzerland

Filed Jan. 31, 1979, Ser. No. 8,098

Claims priority, application Switzerland, Jan. 31, 1978, 1023/78; Feb. 8, 1978, 1391/78

Int. Cl.[3] B24B *3/30;* B24C *3/08*

U.S. Cl. 51—423 25 Claims



1. A continuous drum blasting machine for the continuous passage of workpieces therethrough and concurrent blasting of the workpieces therein with streams of blasting medium, comprising

at least one blasting drum rotatable about an axis inclined with respect to the horizontal, the diameter of said at least one blasting drum decreasing in the direction of passage to provide larger and smaller diameter ends;

at least one blast wheel means for projecting blasting medium into said drum, said blast wheel means being mounted at said larger diameter end of said drum;

a discharge drum fixedly attached to said smaller diameter end of said blasting drum for rotation therewith; and

a housing drum enclosing said blasting and discharge drums.

4,254,593

SHOT OR SAND BLASTING MACHINE

Clemens Paulfeuerborn, Im Stadtsfeld 6, 4270 Dorsten, Fed. Rep. of Germany

Filed Nov. 14, 1979, Ser. No. 94,081

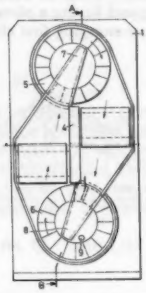
Claims priority, application Fed. Rep. of Germany, Nov. 27, 1978, 2851173

Int. Cl.[3] B24C *3/14*

U.S. Cl. 51—425 5 Claims

1. In a shot blasting machine for blasting elongated rod-like material, said machine comprising a substantially closed housing, means rotatably mounting a first centrifuge wheel in said housing, means rotatably mounting a second centrifuge wheel in said housing spaced from said first centrifuge wheel to define a blasting zone in said housing between said centrifuge wheels, means defining an inlet for blasting shot to said housing, means for conducting said rod-like material through said blasting zone in said housing, and means defining an outlet from said housing for scale blasted from said rod-like material, the improvement comprising driving means for rotating said

first centrifuge wheel and said second centrifuge wheel in the same direction as each other, wall means dividing said blasting zone into a first section and a second section, said wall means having means permitting the passage of said rod-like material therethrough, a first guide device disposed adjacent said first centrifuge wheel in said first section, and a second guide device disposed adjacent said second centrifuge wheel in said second section, said first guide device being operative to guide the



blasting shot from said first centrifuge wheel through said blasting zone to said second centrifuge wheel and said second guide device being operative to guide shot from said second centrifuge wheel through said blasting zone to said first centrifuge wheel, whereby said blasting shot is circulated between said first and second centrifuge wheels and is accelerated thereby and through said blasting zone to blast said rod-like material conducted therethrough.

4,254,594

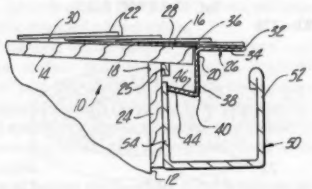
COMBINATION DRIP EDGE MEMBER AND RAKE

Karl Hammond, 3214 Brownell Blvd., and Earl Hammond, 3064 West Dartmouth, both of Flint, Mich. 48504

Continuation-in-part of Ser. No. 772,524, Feb. 28, 1977, abandoned. This application Jun. 28, 1978, Ser. No. 919,789

Int. Cl.³ E04D *13/04, 13/15*

U.S. Cl. 52—11 **7 Claims**



1. In combination with a building construction having a roof with an outwardly extending edge and a facia board underneath and adjacent the roof, a device comprising:

a first portion adapted to flatly abut against the roof and having an extending portion which extends beyond and substantially parallel to the edge of the roof;

a second portion adjacent and substantially parallel to and underneath the first portion and extending from said extending portion of the first portion toward the edge of the roof said second portion having an inner edge disposed closely adjacent said roof;

a third portion engaging the edge of said roof and having a lower depending edge extending substantially vertically downwardly from the inner edge of the second portion;

a fourth portion extending from the lower depending edge of the third portion toward said building construction, said fourth portion being substantially parallel to said first portion and terminating substantially at the facia board; and

wherein said first, second, third and fourth portions are integrally constructed.

4,254,595

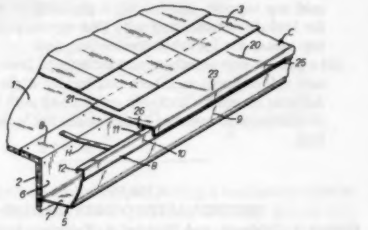
REMOVABLE COVER FOR ROOF GUTTER

Louis J. Crosslen, 1108 Second Ave., Grafton, Wis. 53024

Filed Apr. 4, 1979, Ser. No. 26,919

Int. Cl.³ E04D *13/06*

U.S. Cl. 52—11 **4 Claims**



1. An elongated cover for extending over and covering a roof gutter, said cover being formed of imperforate sheet material and having a rear edge along its length for being inserted under a row of shingles on a roof, said cover also having a front edge with means therealong for engaging a bead along a front side of said gutter, said means comprising a pair of downwardly extending spaced apart flanges adjacent and along said front edge, which flanges define an inverted generally U-shaped groove, said flanges adapted to embrace said bead, said flanges including an outer flange extending over said front side of said bead and an inner flange formed with a series of slits defining individual tabs, said tabs being individually foldable upwardly to accommodate a gutter hanger secured to said gutter bead.

4,254,596

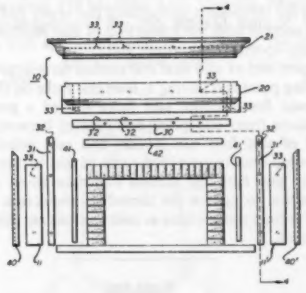
ASSEMBLEABLE MANTELPIECE

John D. Wright, Westfield, and Peter D. Simpson, Englewood, both of N.J., assignors to Rustic Crafts, Englewood, N.J.

Filed Jun. 21, 1978, Ser. No. 917,633

Int. Cl.³ F24B *1/18*; F24C *15/12*

U.S. Cl. 52—36 **6 Claims**



1. An assembleable mantelpiece securable to a wall surrounding a fireplace without subjecting said mantelpiece to damage during assembly and without requiring further finishing as a consequence of such installation comprising:

(a) a top support securable to said wall having a plurality of top means for lockable connection and frontal means for lockable connection;
(b) a pair of side supports securable to said wall, each support having an upper means for lockable connection and a plurality of lower means for lockable connection;
(c) a face connectable across said top support and an upper portion of said side supports said face having a plurality of internal means for lockably connecting with said plurality of top support frontal means for lockable connection; and said face having side means for lockably connecting with said side support upper means for lockable connection;
(d) a mantel top fitable over said face and connectable with said top support and having a plurality of mantel means for lockably connecting with said top support plurality of top means for lockable connection; and
(e) a pair of side members connectable to lower portions of said side support members and having a plurality of side member means for lockably connecting with said plurality of side support member lower means for lockable connection.

4,254,597

SECTIONALIZED DRIVEN ROD

Gilbert J. Feldman, and Richard A. Feldman, both of Tucson, Ariz., assignors to Allied Surveyor Supplies Manufacturing Co., Tucson, Ariz.

Filed Aug. 15, 1979, Ser. No. 66,571
Int. Cl.³ E04F 9/02; E02D 5/74
U.S. Cl. 52—103 **12 Claims**

1. A survey monument adapted to be driven into the ground including in combination:
at least first and second elongated cylindrical rod sections;
means for threadedly connecting the upper end of said first rod section with the lower end of said second rod section in end-to-end relationship; and
the lower end of said first rod section terminated by a penetrating point and having at least one fluke on the periphery of said first section, said fluke spaced a predetermined distance from said point and located between the upper end of said first rod section and said point, said fluke oriented with respect to the axis of said first rod section to cause said first rod section to rotate about its axis in a direction to tighten the threaded connection of said first and second rod sections as said sections are driven into the ground.

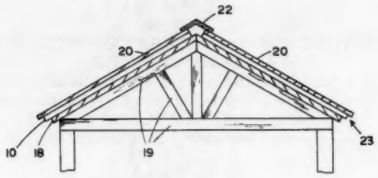
4,254,598

THERMALLY ISOLATED ROOF STRUCTURE

Roger R. Rugroden, 2194 Reaney St., St. Paul, Minn. 55119

Filed May 21, 1979, Ser. No. 40,583
Int. Cl.³ E04B 7/00
U.S. Cl. 52—199 **4 Claims**

1. A ventilated roof structure for maintaining the outside surface of the roof of a building at the ambient outside temperature irrespective of the heat flow through the roof of the building comprising in combination:
a base structure forming at least one generally plane surface over the roof area of a building;
a corrugated insulating panel supported on and fastened to said base structure and constructed from a material of sufficient strength and thickness to support a roof covering structure thereover and to hold nails driven therein, said corrugated panel having a plurality of generally parallel base structure engaging first elongate strips adapted



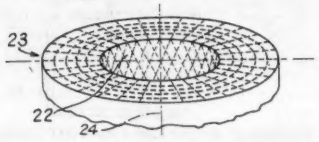
to be fastened to said base structure, said first strips connected along their elongate edges to riser strips which riser strips connect at their edges opposite from said first strips to second elongate strips, which second elongate strips comprise a plurality of generally parallel roof covering engaging strips positioned alternately with said first strips so as to comprise a panel having ventilating air passages parallel to said strips and between said riser strips both above said first strips and below said second strips; and
roof covering structure fastened only to said second elongate strips.

4,254,599

ANNULAR THREE-DIMENSIONAL STRUCTURE USABLE IN PARTICULAR AS REINFORCEMENT

Michel Maistre, Bordeaux, France, assignor to Societe Europeenne de Propulsion, France

Filed Mar. 12, 1979, Ser. No. 19,571
Claims priority, application France, Mar. 29, 1978, 78 09103
Int. Cl.³ E04C 3/26
U.S. Cl. 52—224 **16 Claims**



1. An annular three-dimensional structure, which may be used in particular as reinforcement, comprising a regular interleaving of elongated filiform elements distributed in first, second, third and fourth families, the elements of each family being disposed in parallel, regularly spaced apart sheets themselves constituted by elements extending substantially parallel to one another and being regularly spaced apart, the sheets of the first and second families being alternately disposed in adjacent parallel layers and, similarly, the sheets of the third and fourth families being alternately disposed in adjacent parallel layers, these latter being inclined with respect to those of the first and second families, the elements in each sheet having a different orientation from that of the elements of the adjacent parallel sheet of another family, said structure appearing as being formed by the regular repetition of a basic motif, or unit cell, inscribed in a parallelepiped containing at least one segment of element of each of the four families, these elements

being oriented substantially along the four long diagonals of this parallelepiped, wherein the elements of at least the first and second families are incurved, the direction of incurvation of the elements of the first family being opposite that of the elements of the second family, and the unit cells of the structure conserve substantially the same orientation with respect to the axis of the structure, all around this axis.

4,254,600

MOUNTING FOR DETACHABLY CONNECTING WALL PANELS AND THE LIKE

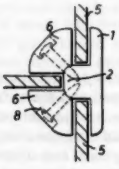
Ruedi Zwissler, Brauerstrasse 113, 9016 St. Gallen, Switzerland

Continuation of Ser. No. 651,276, Jan. 22, 1976, abandoned. This application Feb. 12, 1979, Ser. No. 11,651

Claims priority, application Switzerland, Jan. 22, 1976, 8657/76

Int. Cl.³ E04B *1/38*

U.S. Cl. 52—281 **1 Claim**



1. A mounting for detachably connecting juxtaposed ends of first, second and third panels radiating away from the mounting, said mounting comprising:

a first generally T-shaped jaw member including a pair of oppositely extending arms formed with a first pair of spaced continuous planar jaw surfaces positioned to engage respective faces on one side of the first and second panels adjacent to the ends thereof and a base portion formed integrally with said jaw member and located between the ends of said first pair of panels, said base portion including rounded corner edges,

a pair of further, wedge-shaped jaw members, each having one jaw surface positioned to engage, respectively, the faces of said first and second panels on opposite sides of the respective panels from the faces engaged by said first pair of spaced jaw surfaces, each of said further jaw members having a further jaw surface positioned to engage the third panel,

each of said further wedge-shaped jaw members including a rounded recessed portion which engages and interfits with the reciprocally shaped rounded corner edges of the base portion of the first jaw member and constitutes the sole means for accurately determining the separation of said further wedge-shaped jaw members from the first T-shaped jaw member so as to match the thickness of the first and second panels located between the further jaw members and said first jaw member,

said base portion of said T-shaped jaw member being positioned to engage the ends of all of the three panels which radiate from the mounting, and

means for releasably securing said further jaw members to said base portion of said first jaw member comprising a pair of screws having the heads thereof counter-sunk in respective ones of said further jaw members and extending through said rounded corner edges of said first jaw member.

4,254,601

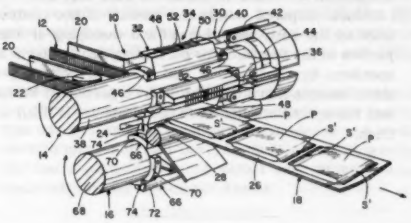
PACKAGING MACHINE HAVING A SLITTER FOR FORMING SLITS IN ENDS OF PACKAGES

Edward N. Prager, Cincinnati, and Louis E. Burnett, Blanchester, both of Ohio, assignors to Keebler Company, Elmhurst, Ill.

Filed Feb. 23, 1979, Ser. No. 14,376

Int. Cl.³ B65B *61/18, 51/16*

U.S. Cl. 53—133 **5 Claims**



1. In an improved assembly for dividing a continuous tubular film strip containing a plurality of longitudinally spaced articles into a plurality of individual sealed packages containing a selected number of said articles, said assembly being of the type which includes a first roller member, a second roller member mounted in cooperative relationship with said first roller member, cooperating means carried by both said first and second roller members for sealing and transversely severing said tubular strip at preselected intervals for forming said packages containing said articles, each of said packages including sealed end portions having outer edges, an improvement in said assembly comprising, in combination, slitter means mounted on said sealing and severing means carried by said first roller member for slitting said end portion, means on said sealing and severing means carried by said second roller member for holding said end portion while said slitter means cuts said end portions, said slitter means and said holding means being constructed and arranged to form at least one slit in at least one of said sealed end portions of each of said packages, said slitter means being positioned on said sealing and severing means for forming said slit substantially simultaneously with said sealing and severing of said tubular strip when forming said packages, said slit being in a direction transverse to and through one of said edges and being spaced from and not penetrating the interior of said package.

4,254,602

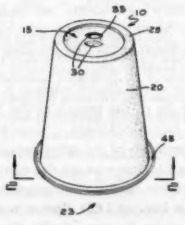
TRASH BAG FILLING DEVICE

Wilson C. Boynton, 178 Madison Ave., Holyoke, Mass. 01040

Continuation-in-part of Ser. No. 898,477, Apr. 20, 1978, abandoned. This application Dec. 28, 1978, Ser. No. 973,915

Int. Cl.³ B65B *67/04*

U.S. Cl. 53—390 **3 Claims**



1. A trash bag filling device comprising a container adapted to receive trash, said container comprising:

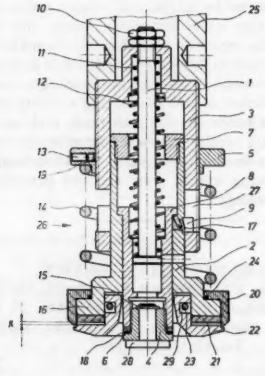
(a) a plastic planar base;
(b) a plastic, rigid sidewall extending from said base;
(c) said base being provided with a pair of spaced adjacent apertures disposed generally in a central portion of said base, said apertures being adapted in size to each receive a plurality of fingers of a user of the device and to define a handgrip in base material between the apertures, said apertures preventing the creation of a vacuum between said container and trash disposed therein for ease in emptying trash from said device into a trash bag; and,
(d) a shield disposed within the interior of the container, fixed to the base, spaced from and overlying at least a portion of the apertures for preventing the fouling of said apertures by trash within said container, whereby the shield ensures that a user can insert a portion of his hand into the apertures even when the container is filled with trash.

4,254,603

PROCESS AND APPARATUS FOR SCREWING ON A SCREW CAP

Albert Obrist, Reinach, Switzerland, assignor to Albert Obrist AG, Switzerland

Filed May 17, 1979, Ser. No. 39,966
Claims priority, application Switzerland, May 17, 1978, 5317/78
Int. Cl.³ B67B *3/20*
U.S. Cl. 53—490 **7 Claims**



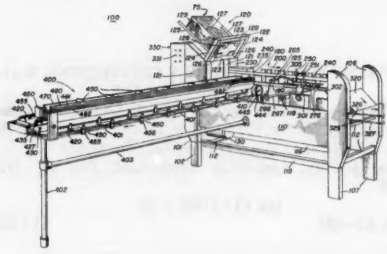
5. A process for screwing a screw cap on to the mouth of a bottle, by apparatus having a sleeve portion adapted to be brought into engagement with the closure cap, and drive means for said sleeve portion wherein a vertical punch member arranged in the center of the sleeve portion is first displaced to press the closure cap on to the mouth of the bottle, the sleeve portion whilst not force-lockingly connected to the drive means, but during operation of the drive means, is brought into engagement with the closure cap on the mouth of the bottle, such that no appreciable torque is transmitted to the sleeve portion or the closure cap, and the sleeve portion is then connected to the drive means by a normally disengaged engageable clutch which comes into engagement only after predetermined engagement of the sleeve portion with the closure cap and which limits the torque transmitted.

4,254,604

CARTONER AND PRODUCT INFEED CONVEYOR THEREFOR

Walter H. Vogel, Hoffman Estates, and Thomas E. Close, Joliet, both of Ill., assignors to Redington Inc., Chicago, Ill.

Filed Jan. 2, 1979, Ser. No. 421
Int. Cl.³ B65B *43/28*
U.S. Cl. 53—566 **46 Claims**

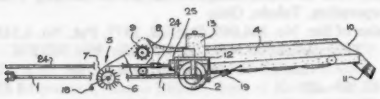


1. A cartoner for inserting a product into an expanded carton having at least one end open and thereafter closing the open end, wherein the cartoner is adjustable to a wide variety of carton shapes and sizes, said cartoner comprising an expanded carton conveyor including three conveyor chains each having equidistantly spaced lugs therealong extending therefrom, the lugs on two of said conveyor chains being in lateral alignment and spaced longitudinally from the lugs on the other of said conveyor chains to provide a pocket receiving an expanded carton therein, mechanism supporting and driving said three conveyor chains along a path from the input end of said cartoner to the output end of said cartoner, said mechanism including geneva drive means for effecting stepwise movement of said conveyor chains, a bottom rail supporting the cartons in said pockets and a top rail guiding the upper surfaces of the cartons to hold the cartons in the pockets as the cartons are carried by said conveyor, said supporting and driving mechanism including adjustment means for accommodating movement of two of said conveyor chains laterally toward and away from each other and the other conveyor chain to adjust the length of the pockets defined by said lugs to accommodate different lengths of cartons, the longitudinal distance between the two laterally aligned sets of lugs and the other set of lugs being adjustable to adjust the width of the pockets defined by said lugs to accommodate different widths of cartons, said top rail being adjustable toward and away from said bottom rail to adjust the depth of the pockets defined by said lugs to accommodate different depths of cartons, an expanded carton feed mechanism adjacent to the input end of said cartoner for depositing expanded cartons one-by-one into the pockets on said expanded carton conveyor from thereabove, a product infeed and filling mechanism adjacent to said cartoner between the input end and the output end of said cartoner for depositing product one-by-one into the cartons in said pockets, means synchronizing the operation of said expanded carton feed mechanism and said product infeed and filling mechanism with said geneva drive means so that the expanded cartons are deposited into the pockets and the product is deposited into the expanded cartons when said expanded carton conveyor is stationary, and closure mechanism on said cartoner between said product infeed and filling mechanism and the output end of said cartoner for closing said cartons with the product therein.

4,254,605
HAY CONDITIONER

Jack Maher, "Shangrilah", N. Condobolin Rd., Forbes, New South Wales, 2871, and Grosvenor F. Francis, Berowra, Leadville, Via Dunedoo, New South Wales, 2744, both of Australia

Filed Jun. 6, 1979, Ser. No. 45,878
Int. Cl.³ A01D *14/02*
U.S. Cl. 56—14.4 **1 Claim**

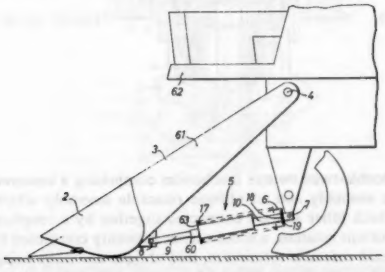


1. A hay conditioner comprising, in combination, a wheeled chassis having angled towing means so that it is towable by a vehicle en echelon, said wheeled chassis supporting:
- a hay pick-up reel on the forward portion thereof;
- a covered conveyor extending toward the rear of said chassis;
- a secondary conveyor downstream from said covered conveyor;
- an offset, downwardly-angled guide chute; and
- a steam generator and associated conduits in communication with a plurality of steam inlet jets disposed in a V-shaped manifold with the apex thereof pointing downstream and positioned adjacent the input region of said covered conveyor, said manifold being mounted upon the underside of the deck of said covered conveyor, which is provided with corresponding apertures therein;
- said hay pick-up reel being positioned near ground level in communication with said input region of said covered conveyor, the output region of which communicates with the input region of said secondary conveyor, the output region of which communicates, in turn, with said offset, downwardly-angled guide chute;
- said secondary conveyor, which is short as compared with the length of said covered conveyor, being pivotally attached at the discharge end of the said covered conveyor for movement in a horizontal plane; and
- said offset, downwardly-angled guide chute extending from the trailing end of said secondary conveyor.

4,254,606
MECHANISM FOR SWIVELING A MACHINE SUB-ASSEMBLY

Gustav Schumacher, II, and Günter Schumacher, both of 5231 Eichelhardt, Westerwald, Fed. Rep. of Germany

Filed Jun. 15, 1978, Ser. No. 915,753
Claims priority, application Fed. Rep. of Germany, Jun. 23, 1977, 2728199
Int. Cl.³ A01D *67/00*
U.S. Cl. 56—208 **3 Claims**

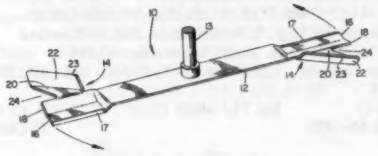


1. In a combination including a first machine element pivotally mounted to a second machine element about an axis of rotation and further including means for pivotally lifting said first machine element relative to said second machine element comprising a lifting cylinder and a lifting piston slidably disposed therewithin, the improvement comprising:
- a spring element having a stroke and mounted with an adjustable prestressing for applying a biasing force tending to support said first machine element;
- hydraulic force transducer means for selectively varying the prestressing of said spring element so that a desired biasing force is applied thereby and in a manner such that said prestressing is so varied independently of the particular position of said lifting piston with respect to said lifting cylinder; and
- means for limiting the stroke of said spring element comprising a bearing member including a flange and a rear bearing face axially displaced from said flange to define a stroke limiting space therebetween and wherein said lifting cylinder has a portion disposed within said stroke limiting space adapted for movement therein.

4,254,607
LOW NOISE PRODUCING LAWN MOWER BLADE

James W. Moore, Horicon, Wis., assignor to Deere & Company, Moline, Ill.

Filed Aug. 21, 1979, Ser. No. 68,773
Int. Cl.³ A01D *55/18*
U.S. Cl. 56—295 **7 Claims**



1. In a rotary mower blade adapted for rotation about an upright axis and having opposite end portions each including a first leading flat portion sharpened to define a cutting edge and a trailing lift wing joined to and angled upwardly in trailing relationship to the leading flat portion, the improvement comprising: a bagging paddle joined to each lift wing; each paddle including a second leading flat portion joined to the lift wing and a trailing fin angled upwardly in trailing relationship to the second leading flat portion; and air pressure relief means defined in the second leading flat portion ahead of the fin.

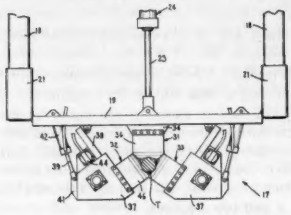
4,254,608
TREE SHAKING APPARATUS

Philip L. Friday, Hartford Township, Van Buren County, Mich., assignor to Friday Tractor Co., Inc., Hartford, Mich.

Filed Apr. 2, 1979, Ser. No. 26,245
Int. Cl.³ A01D *46/00*
U.S. Cl. 56—328 TS **9 Claims**

1. A tree shaking apparatus, comprising: a frame and mobile support means supporting said frame for movement so that said frame can be positioned adjacent to a tree; clamping means mounted on said frame for firmly gripping the trunk of the tree and shaking same, said clamping means comprising a fixed jaw and two movable jaws located on opposite sides of said fixed jaw, said fixed jaw and said two movable jaws each comprising an elastomeric pad for engaging the tree trunk, said two movable jaws being movable with respect to said fixed jaw and with respect to each other between (1) a mutually remote position wherein the elastomeric pads of said two movable jaws are spaced from the tree trunk on opposite sides thereof and (2) a mutually adjacent position wherein the elastomeric pads of said two movable jaws clamp the tree trunk against the

elastomeric pad of said fixed jaw and wherein the elastomeric pad of said fixed jaw and the elastomeric pads of said two movable jaws define the sides of a substantially triangular cavity through which the tree trunk extends upwardly, first mounting means stationarily mounting said fixed jaw on said frame, second and third mounting means mounting said movable jaws on said frame for independent movement between



said mutually remote position and said mutually adjacent position, separate actuating means for independently moving said two movable jaws between said mutually remote position and said mutually adjacent position and separate independently operable vibration means connected to said movable jaws for independently vibrating said movable jaws and thereby shaking the tree when said movable jaws are in said mutually adjacent position.

4,254,609

MACHINES FOR WORKING MOWN CROP

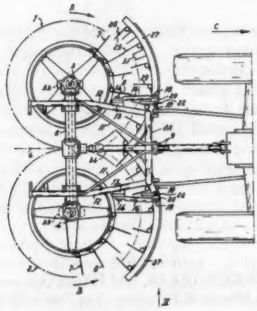
Cornelis van der Lely, 7, Brüschenrain, Zug, Switzerland

Filed Sep. 18, 1978, Ser. No. 943,194

Claims priority, application Netherlands, Sep. 23, 1977, 7710410

Int. Cl.³ A01D *77/00*

U.S. Cl. 56—370 **28 Claims**



1. An agricultural machine for working cut crop lying on the ground, said machine comprising a rotating crop engaging means substantially tangent to the underlying ground having a horizontal axis of rotation transverse to the normal direction of travel of the machine in operation, a hood extending in part over said crop engaging means, means for receiving said crop from the ground and moving said crop to between said hood and said crop engaging means whereby said crop engaging means moves crop through the space between said hood and said crop engaging means and delivers same back onto the ground, crop restraining guides for guiding crop lying on the ground into said receiving means, said crop restraining guides being inclined first downwardly to the rear and then inclined upwardly under said hood, tines resiliently mounted on said hood with free ends spaced closely proximate the outermost cylindrical path of rotation described by said crop engaging means and directed towards the axis of rotation of said crop engaging means for engaging and combing crop moving between said hood and said crop engaging means whereby said crop is returned from the machine to the ground in a combed condition.

4,254,610

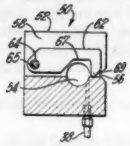
STRAND SPLICING APPARATUS

Richard H. Pierce, Columbus, and Arnold J. Eisenberg, Granville, both of Ohio, assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Division of Ser. No. 864,069, Dec. 23, 1977, Pat. No. 4,143,506. This application Nov. 20, 1978, Ser. No. 962,276

Int. Cl.³ B65H *69/06*; D02J *1/08*

U.S. Cl. 57—22 **5 Claims**



1. In apparatus for splicing a plurality of strands comprising a body having a passageway extending from one end of the body to the other, a first slot communicating with the exterior of the body and with the passageway throughout the length of the passageway, and a fluid inlet communicating with the first passageway and the exterior of the body wherein the improvement comprises:

a movable member spaced from the passageway having a first end pivotally mounted on said body and having a second end opposite said first end retractably positionable in said first slot to retain the strands in said body when a fluid is supplied through said inlet to splice said strands in said passageway.

4,254,611

TEXTILE TWISTER MECHANISM

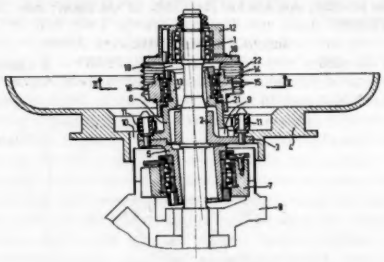
Albert Simon, Choisy-le-Roi, France, assignor to SKF Compagnie d'Applications Mechaniques, Clamart, France

Filed Aug. 29, 1979, Ser. No. 70,368

Claims priority, application France, Sep. 4, 1978, 78 25434

Int. Cl.³ D01H *7/8C*

U.S. Cl. 57—58.72 **3 Claims**



1. A double-twist twister mechanism comprising a centered rotatable assembly and an oblique rotatable assembly which overlap each other and are connected together by a coupling for concurrent rotation, a spool carrier rotatably connected to both of said rotatable assemblies, said oblique assembly being connected to the spool carrier by means which includes a bearing housing and bearings which support one end of the

oblique assembly for rotation in the bearing housing, said housing having an exterior surface with two oppositely facing convex cylindrical surfaces which are transversely oriented relative to the rotational axis of the oblique assembly, said spool carrier including a base piece with two opposite depending portions which have parallel planar internal surfaces spaced apart to contact the convex surfaces of the housing with a minimum of play.

4,254,612

DEVICE FOR PREVENTING THE ACCUMULATION OF FIBERS IN AN OPEN-END SPINNING FRAME

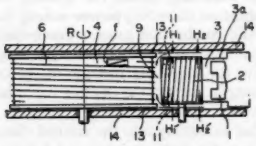
Noriaki Miyamoto; Masao Shiraki, both of Kariya, and Kinpei Mitsuya, Aichi, all of Japan, assignors to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho, Aichi, Japan

Filed Oct. 9, 1979, Ser. No. 82,723

Claims priority, application Japan, Oct. 13, 1978, 53/141039[U]; Oct. 16, 1978, 53/141756[U]

Int. Cl.³ D01H *7/895*

U.S. Cl. 57—58.95 **6 Claims**



1. An open-end spinning frame comprising a fiber feeding mechanism including a feed roller having first and second end surfaces and a presser urged towards said feed roller, a combing roller having first and second end surfaces for combing fibers fed from said feed roller, a rotor for spinning said fibers delivered from said combing roller respectively, and first and second planar side plates disposed adjacent the first and second end surfaces, the width of said feed roller between the end surfaces thereof being less than the width of said combing roller between the end surfaces thereof, whereby said feeding mechanism is provided at a widthwise side region thereof with a passage for flowing air current which prevents accumulation of fibers therearound, said passage having an enlarged portion adjacent the end surfaces of said feed roller.

4,254,613

YARN BREAK DETECTOR IN RING FRAMES

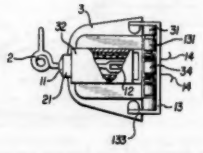
Isao Arita, Hirakata, and Fumitaka Maede, Kobe, both of Japan, assignors to Shinzo Kitamura, Hirakata, Japan

Filed May 16, 1979, Ser. No. 39,587

Claims priority, application Japan, May 16, 1978, 53/58577; Jun. 13, 1978, 53/71970

Int. Cl.³ D01H *13/16*

U.S. Cl. 57—81 **6 Claims**



1. A yarn break detector for a ring frame, comprising:

a yarn guide adapted to contact spinning yarns;

a piezoelectric element having leads and mechanically coupled to said yarn guide for detecting vibrations of said yarn guide;

a holder for supporting said yarn guide and for housing said piezoelectric element, said holder having a pair of slots in which are mounted respective conductive plates each electrically connected to a respective lead of said piezoelectric element;

a lappet having a guide side and an installation side and including,

a slide receptor extending from said guide side toward said installation side,

a U-shaped member having a pair of slotted fingers adapted to be mounted within said slide receptor,

electrically conductive members extending from said installation side into the slots of said fingers, each having spring loaded contact portions emerging from said slotted fingers for making contact with a respective conductive plate and an installation portion for making electrical connection thereto at said installation side;

wherein said holder is adapted to be mounted within said fingers of said U-shaped bracket within said slide receptor with the conductive plates completing the electrical connection between said piezoelectric element leads and said electrically conductive members.

4,254,614

DEVICE FOR SUPPORTING A SPINDLE OF AN OPEN-END SPINNING FRAME

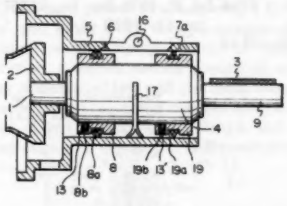
Noriaki Miyamoto; Masao Shiraki, both of Kariya, and Kinpei Mitsuya, Aichi, all of Japan, assignors to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho, Aichi, Japan

Filed Oct. 9, 1979, Ser. No. 82,721

Claims priority, application Japan, Oct. 18, 1978, 53-143672[U]; Oct. 19, 1978, 53-144039[U]

Int. Cl.³ D01H *1/135;* **F16C** *35/08*

U.S. Cl. 57—58.89 **11 Claims**



1. A device for supporting a spindle in an open-end spinning frame, which device comprises a rotatable spindle, a bearing casing for rotatably supporting said spindle, a holder for holding said bearing casing therein, and at least two annular elastic members, spaced from each other along an axial direction of said spindle and disposed between said bearing casing and said holder, for preventing the vibration of said spindle, wherein at least one of said members is detachably coupled to said bearing casing so as to be readily removable therefrom.

4,254,615

APPARATUS FOR CONTROLLING THE BOBBIN DRIVE OF A FLYER ROVING FRAME

Hermann Adolf, and Bernhard Grupp, both of Ingolstadt, Fed. Rep. of Germany, assignors to Schubert & Salzer, Ingolstadt, Fed. Rep. of Germany

Filed Apr. 12, 1979, Ser. No. 29,384

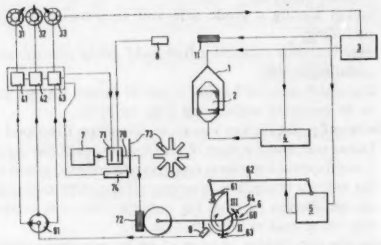
Claims priority, application Fed. Rep. of Germany, Apr. 22, 1978, 2817711

Int. Cl.³ D01H *7/50*

U.S. Cl. 57—96 **8 Claims**

1. An apparatus for controlling the bobbin drive of a flyer roving frame, a flyer associated with said bobbin; a drive roll

supplying roving to said flyer; drive means for driving said flyer, supply roll and said bobbin; a differential gear interposed between said drive means and said bobbin; adjustment means connected to said differential gear for varying the speed of rotation of said bobbin, and means for controlling said drive means for adjusting the driving speed of said flyer and drive



roll stepwise to different rotation speed stages during building of said bobbin, the improvement comprising:

means for stepwise varying said adjustment means a different degree within said respective rotation speed stages so as to vary the driving speed of said bobbin within said rotation speed stages.

4,254,616

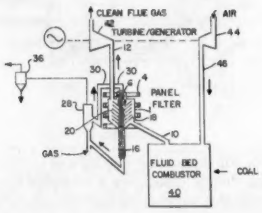
PROCESS FOR FLUE GAS DESULFURIZATION OR NITROGEN OXIDE REMOVAL USING A MAGNETICALLY STABILIZED FLUID CROSS-FLOW CONTACTOR

Vincent Siminski, Rockaway, N.J.; Martin O. Gernand, and Francis X. Mayer, both of Baton Rouge, La., assignors to Exxon Research and Engineering Co., Florham Park, N.J.

Filed Jul. 31, 1979, Ser. No. 62,557

Int. Cl.³ F02B *43/00*

U.S. Cl. 60—39.12 **11 Claims**



1. A process for flue gas desulfurization or nitrogen oxide removal, said process comprising the steps:

(a) continuously introducing and removing a bed of solids through at least one porous chamber in a descending manner or direction, said bed of solids comprising a plurality composition capable of accepting sulfur oxide and-/or nitrogen oxide;

(b) structuring and controlling the porosity in said bed by applying a magnetic field to said bed in a manner such that the magnetic field is substantially colinear with the external force field within said chamber;

(c) passing a gas containing sulfur oxides and/or nitrogen oxides through said descending bed of solids in a manner such that it has a velocity component substantially perpendicular to the external force field and the applied magnetic field within said chamber and withdrawing a gaseous stream substantially free of sulfur oxides and/or nitrogen oxides.

4,254,617

COMBUSTION UNIT

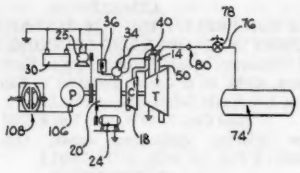
Kurt R. Papsdorf, Florida, South Africa, assignor to Deams (Proprietary) Limited, Johannesburg, South Africa

Filed Nov. 9, 1978, Ser. No. 959,154

Claims priority, application South Africa, Nov. 29, 1977, 77/7096; May 16, 1978, 78/2807

Int. Cl.³ F02C *3/22, 5/00*

U.S. Cl. 60—39.46 G **15 Claims**



1. A combustion unit for using gaseous fuels, the unit including a combustion chamber; means for igniting combustion fluids in the combustion chamber; power output means drivable by the resulting combustion gases; a compressor for supplying air to the combustion chamber; and a gas supply including a control valve for supplying fuel gas to the combustion chamber for burning in the air, the control valve having

a control chamber,

an outlet member extending into the control chamber,

an outlet passage in the outlet member and defining an outlet from the control chamber, said passage communicating with the combustion chamber to supply fuel gas to the combustion chamber,

an inlet for supplying fuel gas into the control chamber and capable of communicating with the outlet,

a valve seat in the control chamber and surrounding the inlet, and

a shuttle piston movable along the outlet member, the shuttle piston having a closure surface for engaging the valve seat to close the inlet,

wherein fuel gas flowing into the inlet holds the closure surface away from the valve seat and thus flows through the control chamber to the outlet and to the combustion chamber until combustion gases in the combustion chamber create a backflow to the outlet at a pressure sufficiently in excess of the pressure at the inlet to move the closure surface towards the valve seat and to close the inlet.

4,254,618

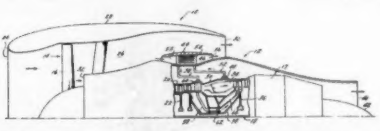
COOLING AIR COOLER FOR A GAS TURBOFAN ENGINE

Ernest Elovic, Cincinnati, Ohio, assignor to General Electric Company, Cincinnati, Ohio

Filed Aug. 18, 1977, Ser. No. 825,614

Int. Cl.² F02K *3/02;* F02C *7/12*

U.S. Cl. 60—226 R **2 Claims**



1. In a gas turbine engine of the bypass variety having a fan for pressurizing a cool flow of fan bypass air; a core engine including a compressor for pressurizing a hot flow of cooling air; a turbine of the air cooled variety; a heat exchanger for receiving a portion of the cool bypass air and a portion of the hot cooling air, wherein heat is transferred directly from the

hot cooling air portion to the bypass air portion thereby resulting in a flow of cooled cooling air; and a means for routing the cooled cooling air to the turbine for turbine cooling; an improvement comprising:

a duct for routing the bypass air around the core engine;

means for capturing a portion of the bypass air from said duct, said capturing means defining a flow passage having a diffuser section to substantially recover the dynamic head of the fan bypass portion, and wherein said heat exchanger is disposed within said passage downstream of said diffuser section.

4,254,619

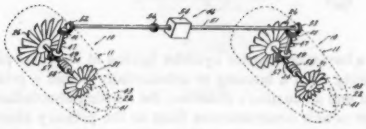
PARTIAL SPAN INLET GUIDE VANE FOR CROSS-CONNECTED ENGINES

Rollin G. Giffin, III, Montgomery, and Onofre T. M. Castells, Fairfield, both of Ohio, assignors to General Electric Company, Cincinnati, Ohio

Filed May 1, 1978, Ser. No. 901,934

Int. Cl.³ F02K *3/04, 3/075*

U.S. Cl. 60—226 R **1 Claim**



1. A dual turbofan engine arrangement comprising:

(a) first and second turbofan engines each having a core section and a low pressure system including a fan, a bypass duct and a turbine;

(b) cross shaft means operably interconnecting said low pressure systems such that said first engine turbine can drive said second engine fan;

(c) means in said second engine for selectively disengaging its fan from its turbine;

(d) variable flow means in the bypass duct of said first engine, said flow means being capable of varying the airflow in said bypass duct without appreciably varying the flow to its associated core section; and wherein

(e) said variable flow means comprises variable inlet guide vanes that are cantilevered at their radially outer ends and do not extend radially inward to an extent that they appreciably affect the airflow to the core.

4,254,620

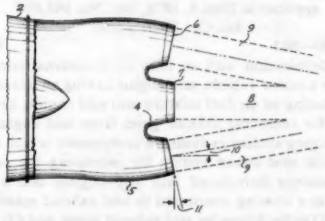
JET ENGINE MULTIDUCT NOISE SUPPRESSOR

Charles P. Wright, and Russel L. Thornock, both of Seattle, Wash., assignors to The Boeing Company, Seattle, Wash.

Filed Feb. 27, 1978, Ser. No. 881,681

Int. Cl.³ F02K *1/40, 1/48*

U.S. Cl. 60—263 **10 Claims**



1. A jet engine exhaust noise suppressor having a longitudinal axis and comprising a plurality of exhaust ducts from which the major portion of the jet engine exhaust is discharged, each of said ducts having an outer portion remote from the suppressor axis which outer portion projects rearward farther than any other portion of that duct, the passage through each of said ducts being nondivergent rearward relative to the suppressor axis from a location forward of the farthest forward point of the discharge end of that duct, and the discharge end of each of said ducts being canted inward relative to a plane perpendicular to the passage through that duct at the farthest forward point of said discharge end of that duct, said canted discharge ends of said ducts contributing to discharging the exhaust jets from said ducts in rearwardly convergent relationship.

4,254,621

HEAT-INSULATING LAYER TO PREVENT TEMPERATURE DROP OF COMBUSTION GAS IN INTERNAL COMBUSTION ENGINE

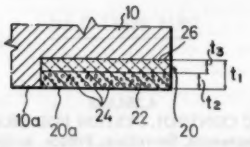
Shinichi Nagumo, Yokohama, Japan, assignor to Nissan Motor Company, Limited, Yokohama, Japan

Filed Mar. 2, 1979, Ser. No. 17,008

Claims priority, application Japan, Mar. 27, 1978, 53/38108

Int. Cl.³ B22D *19/08*

U.S. Cl. 60—282 **13 Claims**



1. A heat-insulating layer secured to a cast metal member of an internal combustion engine in such an arrangement that the heat-insulating layer is exposed to a combustion gas produced in the engine, the heat-insulating layer comprising:

a metal body having a porous structure, only a first surface portion of said metal body being impregnated with a heat-insulating ceramic material which is fired in said surface portion, a second surface portion of said metal body being cast-inserted into said cast metal member such that the metal of said cast metal member infiltrates into at least a part of said second surface portion and that said first surface portion is exposed to said combustion gas in the engine.

4,254,622

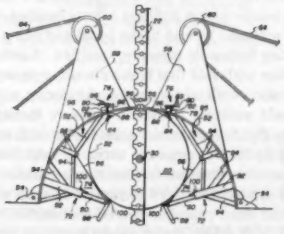
HYDRODYNAMIC GRAVITY MOTOR

Jack G. Denson, Sr., 1306 Landon St., Stamford, Tex. 79553

Division of Ser. No. 857,510, Dec. 5, 1977, abandoned. This application Jun. 20, 1979, Ser. No. 50,311

Int. Cl.³ F03B *17/02*

U.S. Cl. 60—496 **6 Claims**



1. A radial gate valve assembly for use in a hydrodynamic gravity motor for admitting successive ones of a plurality of

closed vessels into a reservoir holding a vertical column of liquid, comprising:

two normally closed arcuate upper radial gate panels hinged at one edge to the bottom wall of the reservoir for movement between the normally closed and an open position, including side walls formed on the ends of each of said arcuate upper panels;

two normally closed retractable lower panel members extending upwardly from said upper panel members, such that a chamber is defined between said upper and lower panels and said side walls for receiving successive ones of said closed vessels;

said upper and lower panel members operating in sequence, such that said lower panel members first retract to open and sdmit one of said closed vessels, said lower panel members returning to the normally closed position before said normally closed upper panel members open to admit said closed vessel to the reservoir; and

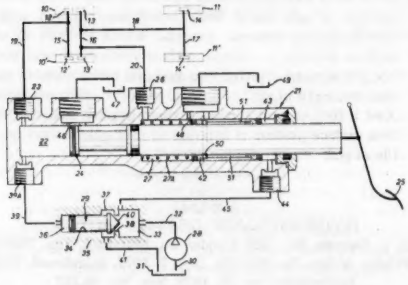
valve means operating in response to one of said closed vessels entering said chamber defined by said upper and lower panel members for introducing liquid from the reservoir into the chamber, such that an initial upward buoyant force is provided to said closed vessel.

4,254,623

HYDRAULIC CONTROL SYSTEM FOR BRAKE DEVICE

Jean L. R. Dauvergne, Survilliers, France, assignor to Societe Anonyme Francaise du Ferodo, Paris, France

Filed Aug. 25, 1978, Ser. No. 936,900
Claims priority, application France, Sep. 9, 1977, 77 27350
Int. Cl.[3] B60T *13/12*
U.S. Cl. 60—548 **6 Claims**



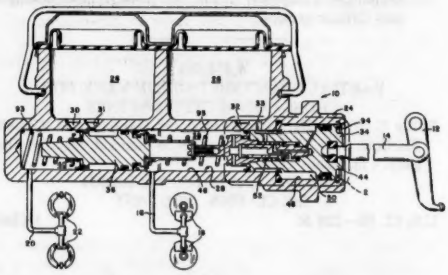
1. A hydraulic control system for a brake device, said system comprising independent first and second brake circuits, a brake pedal, a source of assisting hydraulic pressure, a master cylinder having a master piston defining a first chamber, said master piston being actuated by said brake pedal and being insensitive to said assisting hydraulic pressure, said first chamber being in communication with said first brake circuit, a second chamber in communication with said second brake circuit, a third chamber fed by said assisting hydraulic pressure through a valve controlled by the first chamber pressure in such manner that said assisting hydraulic pressure varies as said first chamber pressure, a movable pressure transmitting separator interposed between said second and third chambers in such manner that pressure in said third chamber can be transmitted to said second chamber, and safety thrust means operable between said master piston and said separator in such manner that actuation of said piston can actuate said separator to increase the pressure in said second chamber.

4,254,624

TWO-STAGE MASTER CYLINDER AND VALVE MEMBER THEREFOR

Robert F. Gaiser, Stevensville, Mich., assignor to The Bendix Corporation, Southfield, Mich.

Filed May 14, 1979, Ser. No. 39,020
Int. Cl.[3] B60T *11/08*
U.S. Cl. 60—574 **10 Claims**



1. In a two-stage master cylinder having at least one piston cooperating with a housing to substantially define a primary chamber and an auxiliary chamber, the housing also defining a reservoir which communicates fluid to the primary chamber and the auxiliary chamber, the one piston being movable within the housing to communicate fluid pressure from the primary chamber to a brake circuit and from the auxiliary chamber to the primary chamber, and a valve member responsive to fluid pressure within the primary chamber to open communication between the auxiliary chamber and the reservoir during a brake application, the improvement wherein said valve member is responsive to fluid pressure in said auxiliary chamber to increase and decrease communication between said auxiliary chamber and said reservoir as said piston is moved within said housing during a brake application, said valve member being movably disposed within said piston, said valve member defining a first diameter exposed to the fluid pressure within said primary chamber so as to bias said valve member to a position closing communication between said auxiliary chamber and said reservoir, and said valve member defining a second diameter exposed to the fluid pressure within said primary chamber so as to bias said valve member to a position opening communication between said auxiliary chamber and said reservoir.

4,254,625

TURBO CHARGING SYSTEMS

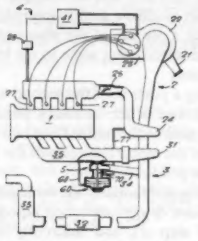
Dan Bergstedt, Södertälje, and Anders E. B. Johansson, Enbörna, both of Sweden, assignors to Saab-Scania AB, Södertälje, Sweden

Continuation of Ser. No. 758,956, Jan. 13, 1977, abandoned. This application Dec. 4, 1978, Ser. No. 965,984
Int. Cl.[3] F02B *37/00*
U.S. Cl. 60—602 **9 Claims**

1. In combination with an Otto cycle internal combustion engine for a motor vehicle, said engine having an intake system for introducing an air-fuel mixture into said engine, an exhaust manifold for removing exhaust gases from said engine, and a super-charging system including a compressor which communicates with said intake system for increasing the supply of air-fuel mixture introduced into said engine, and a turbine arranged in a housing connected to said exhaust manifold and adapted (1) to be driven by said exhaust gases, and (2) to drive said compressor; said super-charging system comprising, in combination:

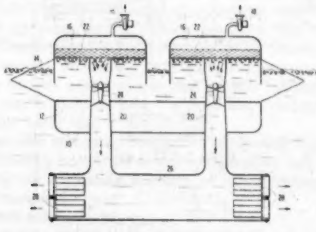
a duct connected to said exhaust manifold for directing exhaust gases to by-pass said turbine;

a control valve for controlling the amount of exhaust gases flowing through said duct from said exhaust manifold;
exhaust gas pressure-transmitting means mounted in said exhaust manifold and connecting said exhaust manifold, upstream of said turbine with said control valve;
said duct and said control valve being mounted separately in relation to said turbine housing;
said control valve comprising a valve actuator mechanism connected to said exhaust gas pressure-transmitting means for actuating said control valve in dependence of the exhaust gas pressure;
said control valve being of the disc-valve type including a valve spindle connected to said valve actuator mechanism;



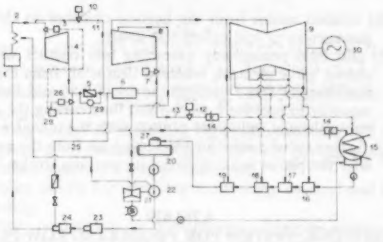
a spring in said valve actuator mechanism acting upon said valve spindle to hold said valve closed;
said control valve having a sealing face on the face of said valve disc adjacent said spindle for cooperating with a valve seating, the opposite face of said valve disc facing said exhaust manifold so as to be exposed to full exhaust gas pressure, whereby said control valve is biased to a closed position in which the sealing face of said valve disc blocks the flow of exhaust gases through said by-pass duct, by both said spring and the exhaust gas pressure in the exhaust manifold upstream of said turbine acting upon said opposite face of said valve disc; and
said control valve being biased to an open position, when the exhaust gas pressure acting upon said valve actuator mechanism is above a predetermined level.

4,254,626
DEAERATING SYSTEM FOR SEA THERMAL POWER PLANTS
J. Hilbert Anderson, York, Pa., assignor to Sea Solar Power, York, Pa.
Filed Aug. 14, 1979, Ser. No. 66,512
Int. Cl.³ F03G *7/02, 7/04*
U.S. Cl. 60—641 **4 Claims**



1. A thermal power plant having a hull, comprising means for preventing crustaceae from growing on heat exchange surfaces thereof, including:
a plurality of pipes arranged in said hull in spaced parallel relation to one another and terminating in a common plenum chamber carried by said pipes beneath said hull;
a plurality of boilers in said chamber communicating with the sea;
pumps positioned in said pipes;
the inlet end of said pipes being positioned above the level of the sea;
a deaerator having a domed portion positioned over the inlet end of each of said pipes;
a compressor connected to each of said domed portions for pulling a vacuum to lift the sea water into the domed portion to a level above the inlet end of each pipe;
said pumps syphoning the sea water over the inlet ends and flowing said sea water through said pipes and chamber and boiler.

4,254,627
STEAM TURBINE PLANT
Helmut Gruber, Baden, and Kurt Reinhard, Neuenhof, both of Switzerland, assignors to BBC Brown Boveri & Company Limited, Baden, Switzerland
Filed Jul. 9, 1979, Ser. No. 55,809
Claims priority, application Switzerland, Aug. 10, 1978, 8510/78
Int. Cl.³ F01K *13/02*
U.S. Cl. 60—646 **13 Claims**

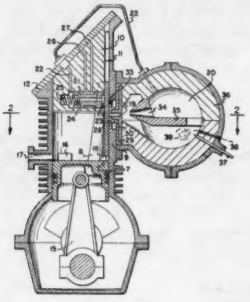


1. A steam turbine plant comprising:
a steam supply pipe;
a first turbine supplied by said steam supply pipe;
a first turbine outlet;
at least one superheater connected to the turbine outlet;
a discharge pipe line joined at a first connection between the high-pressure turbine outlet and the superheater;
means for regulating the flow in the discharge pipe line; and
control means for opening and closing the means for regulating the flow in said discharge pipe in response to at least one pressure within the steam turbine plant.

4,254,628
SLIDING-VALVE IN A HEATING-CHAMBER COMBUSTION ENGINE
George K. Buergel, 6 Stone Rd., Plainview, N.Y. 11803
Filed Aug. 2, 1978, Ser. No. 930,370
Int. Cl.³ F02G *1/02*
U.S. Cl. 60—682 **1 Claim**

1. An open air cycle engine comprising:
(a) a cylinder;
(b) a piston slideably engaged within said piston;
(c) a cylindrical insert at the upper portion of the cylinder with a fluid passage provided therein;
(d) a heating chamber located in close proximity with the outer sidewalls of the cyliner;
(e) an air passageway in the cylinder sidewall providing communication with the heating chamber and the space within the cylinder, said passageway being located at a position approximately adjacent the top dead center of the piston's travel;

(f) a valve element mounted on the piston extending vertically upwards and in sliding contact with the inner cylinder wall, whereby the air passageway is closed by the valve element during substantially all of the piston travel;
(g) an opening in the valve element allowing communication between the air passageway and said chamber when said opening is aligned with the air passageway, said valve opening being in alignment with the air passageway only when the piston is approximately at it's top dead center of travel;



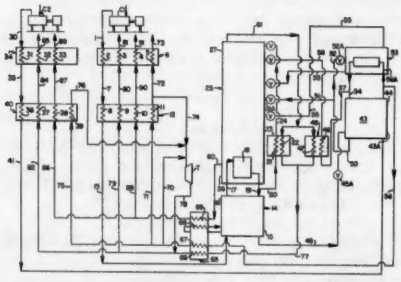
(h) conduit means from the heating chamber to the fluid passageway in said cylindrical insert;
(i) said fluid passageway extending into contact with the sliding valve element, whereby heated air from the heating chamber flows through the conduit to said fluid passageway to provide a pressurized fluid biasing the sliding valve element into close contact with the cylinder wall;
(j) further valve means for exhausting air from the cylinder after the piston has completed its working stroke.

4,254,629

CRYOGENIC SYSTEM FOR PRODUCING LOW-PURITY OXYGEN

Walter J. Olszewski, Tonawanda, N.Y., assignor to Union Carbide Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 903,407, May 8, 1978, abandoned. This application May 1, 1980, Ser. No. 145,882
Int. Cl.³ F25J *3/04*
U.S. Cl. 62—13 **17 Claims**



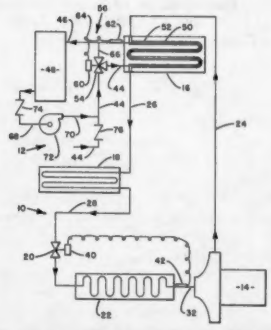
1. A process for producing low-purity oxygen from feed air by low-temperature distillation comprising the steps of:
(a) supplying a high-pressure gas feed stream, comprising at least 35 percent of said feed air, at pressure of at least 65 psia, in a cleaned, cooled state,
(b) distilling said high-pressure gas feed stream in a higher-pressure distillation column so as to produce first intermediate oxygen-enriched liquid at the lower end and first nitrogen-rich gas at the upper end of said column;
(c) heat exchanging the first nitrogen-rich gas with colder oxygen-enriched liquid so as to condense the first nitrogen-rich gas as reflux for said higher-pressure distillation column and a lower-pressure distillation column while simultaneously vaporizing the oxygen-enriched liquid as vapor for upward flow through said lower-pressure distillation column;
(d) supplying a low-pressure gas feed stream, comprising no more than 65 percent of said feed air, at pressure of from 40 to 80 psia, but at least 10 psia less than the pressure of said high pressure gas feed stream, in a cleaned, cooled state;
(e) distilling the low-pressure gas feed stream against a colder liquid reflux in an auxiliary distillation column so as to produce second intermediate oxygen-enriched liquid at the lower end and second nitrogen-rich gas at the upper end of said auxiliary distillation column;
(f) expanding a portion of the intermediate oxygen-enriched liquid and introducing same to the lower-pressure distillation column;
(g) removing a portion of the second nitrogen-rich gas from the upper end of the auxiliary distillation column, in an amount equal to the molar flow rate of between 20 and 70 percent of the molar flow rate of the low-pressure gas feed stream, as product;
(h) expanding substantially the remainder of the unexpanded intermediate oxygen-enriched liquid, separately from the liquid of step (f), and indirectly heat exchanging said remainder with unremoved second nitrogen-rich gas outside of the aforementioned distillation columns, condensing said unremoved second nitrogen-rich gas and at least partially vaporizing the remainder of the intermediate oxygen-enriched liquid;
(i) introducing at least a part of the condensed second nitrogen-rich vapor to the auxiliary distillation column as said colder liquid reflux therefore;
(j) introducing the expanded and at least partially vaporized oxygen-enriched mixture form in step (h) to the lower pressure distillation column; and
(k) distilling the streams introduced to the lower pressure distillation column so as to produce a product stream of low-purity oxygen at the bottom thereof and a nitrogen-rich gas-stream at the top thereof.

4,254,630

HEAT RECLAIMING METHOD AND APPARATUS

David F. Geary, Fayetteville, N.Y., assignor to Carrier Corporation, Syracuse, N.Y.

Filed Jun. 1, 1979, Ser. No. 44,823
Int. Cl.³ F25B *7/00, 27/02*
U.S. Cl. 62—79 **8 Claims**



1. A method of operating apparatus for reclaiming heat from a vapor compression refrigeration circuit, the heat reclaiming apparatus having a heat exchanger, an inlet line connecting the

heat exchanger with a source of a heat transfer fluid, an outlet line connecting the heat exchanger with a heat storage facility, and a bypass line connecting the inlet and outlet lines, the method comprising the steps of:

conducting refrigerant vapor from the refrigeration circuit through the heat exchanger;

conducting heat transfer fluid through the heat exchanger in heat transfer relation with refrigerant vapor to heat the fluid and cool the vapor;

conducting heated heat transfer fluid from the heat exchanger, through the outlet line, past the bypass line, and to the heat storage facility;

sensing the temperature of the heat transfer fluid passing through a portion of the outlet line between the heat exchanger and the bypass line; and

controlling the heat transfer fluid to decrease the amount of the fluid passing through the heat exchanger when the sensed temperature falls below a predetermined level.

4,254,631

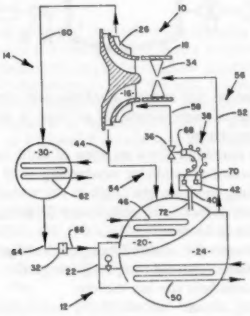
METHOD AND APPARATUS FOR SATISFYING HEATING AND COOLING DEMANDS AND CONTROL THEREFOR

Gary S. Leonard, Minoa, and Raymond L. Eckman, Manlius, both of N.Y., assignors to Carrier Corporation, Syracuse, N.Y.

Filed Sep. 26, 1979, Ser. No. 78,877

Int. Cl.³ F25B *1/0*

U.S. Cl. 62—117 **9 Claims**



1. Apparatus for satisfying heating and cooling demands comprising:

a cooling circuit for satisfying the cooling demand and including a mechanical refrigeration unit having a high pressure side and a low pressure side;

a heating circuit for satisfying the heating demand and including

a booster compressor for compressing refrigerant vapor,

a booster inlet line for transmitting refrigerant vapor from the high pressure side of the refrigeration unit to the booster compressor for further compression therein,

a heat reclaiming condenser for passing refrigerant vapor from the booster compressor in heat transfer relation with a heat transfer fluid to heat the fluid and condense the refrigerant vapor, and

return means for returning condensed refrigerant from the heat reclaiming condenser to the refrigeration unit;

valve means for regulating the flow of vapor through the booster compressor; and

valve control means including

stabilizing means acting in response to the pressure in the high pressure side of the refrigeration unit falling below a first set point for preventing the valve means from increasing the vapor flow through the booster compressor, and

means for operating the valve means to reduce the vapor flow rate through the booster compressor when the pressure in the high pressure side of the refrigeration unit falls below a second set point less than the first set point.

4,254,632

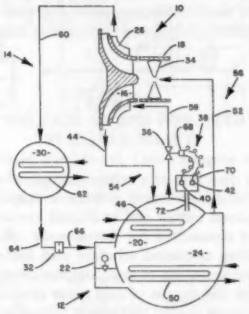
METHOD AND APPARATUS FOR SATISFYING HEATING AND COOLING DEMANDS AND CONTROL THEREFOR

Thomas M. Zinsmeyer, Pennelville, and Gary S. Leonard, Minoa, both of N.Y., assignors to Carrier Corporation, Syracuse, N.Y.

Filed Sep. 26, 1979, Ser. No. 78,878

Int. Cl.³ F25B *1/10*

U.S. Cl. 62—117 **10 Claims**



1. Apparatus for satisfying heating and cooling demands comprising:

a cooling circuit for satisfying the cooling damand and including a mechanical refrigeration unit having a high pressure side and a low pressure side;

a heating circuit for satisfying the heating damand and including

a booster compressor for compressing refrigerant vapor,

a booster inlet line for transmitting refrigerant vapor from the high pressure side of the refrigeration unit to the booster compressor for further compression therein,

a heat reclaiming condenser for passing refrigerant vapor from the booster compressor in heat transfer relation with a heat transfer fluid to heat the fluid and condense the refrigerant vapor, and

return means for returning condensed refrigerant from the heat reclaiming condenser to the refrigeration unit; and

control means for reducing the vapor flow rate through the booster compressor when the pressure in the high pressure side of the refrigeration unit falls below a predetermined value.

4,254,633

CONTROL APPARATUS FOR AN AIR CONDITIONER

Hirokuni Murakami, Yamatokouriyama, and Hiroshi Horii, Kashihara, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma City, Japan

Filed Apr. 12, 1979, Ser. No. 29,531

Claims priority, application Japan, Apr. 20, 1978, 53/047451; Apr. 20, 1978, 53/047452

Int. Cl.³ F25D *21/06*; G05D *23/32*

U.S. Cl. 62—155 **7 Claims**

1. A control apparatus for an air conditioner comprising:

a thermostat circuit including a temperature detection element and a comparator to issue an output upon detection of a reaching of measured temperature to a predetermined temperature,

a timer circuit including a clock generator and a counter, and

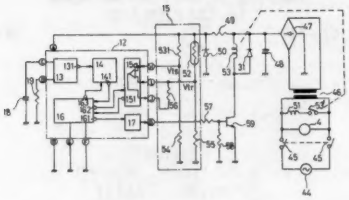
a logic circuit,

said thermostat circuit excluding said temperature detection

element, said timer circuit and said logic circuit being formed in a semiconductor IC,

said logic circuit having a control terminal to receive a control input for switching logic gates therein thereby selecting connections of the logic circuit between

a first connection for defrosting of an outdoor unit in a room heating operation wherein a detection of an output signal from said thermostat circuit is interrupted for a first specified time period, thereafter said counter begins counting of a second specified time period and a switch for reversing a flow direction of a refrigerant gas is actuated upon receipt of an earlier one of respective output signals from said thermostat circuit and said timer circuit,



and a second connection for temperature controlling for a room cooling operation wherein said thermostat circuit controls the actuation of said compressor motor independently from the output of said timer circuit, a hysteresis voltage is given to said thermostat circuit at a stopping of said compressor motor and said timer circuit counts a third specified time period after stopping of said compressor motor.

4,254,634

CONTROL VALVE TO BE EMPLOYED FOR REFRIGERATOR AND AIR CONDITIONER

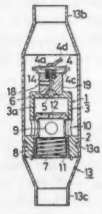
Ohno Akio, Tokyo, and Tamura Yuichi, Kawasaki, both of Japan, assignors to Fuji Koki Manufacturing Oc., Ltd., Tokyo, Japan

Filed Dec. 12, 1977, Ser. No. 859,473

Claims priority, application Japan, Dec. 12, 1976, 51-166856[U]; Dec. 13, 1976, 51-149518; Dec. 13, 1976, 51-166855[U]; Jun. 2, 1977, 52-64011

Int. Cl.³ F25B *4/04*

U.S. Cl. 62—217 **25 Claims**



1. A cartridged control valve, comprising, in combination, a fitting base with a short cylindrical shape, a seat with a cylindrical shape as one body on top of said fitting base, a piston which is movably disposed within said seat and said fitting base, a monitor means placed on top of said seat, said seat being provided with a seat orifice and a pilot chamber between said seat orifice and said piston and said monitor means comprising a diaphragm supporter, a diaphragm dividing said diaphragm supporter into an upper chamber and a diaphragm chamber, and a pilot valve, directly connected with said diaphragm and housed in said pilot chamber, to open or close said seat orifice, and a tube to be fabricated, by spinning to be applied along a circle around said fitting base, for sealably separating an inlet tube from an outlet tube and for forming a body of said control valve together with said inlet tube and outlet tube after being assembled with said fitting base, said seat, said piston, and said monitor means.

4,254,635

INSTALLATION FOR THE STORAGE OF CONTINUOUSLY GENERATED COLDNESS AND FOR THE INTERMITTENT EMISSION OF AT LEAST A PORTION OF THE STORED COLD

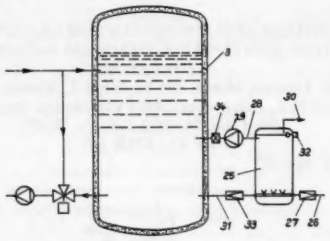
Laszlo Simon, 61 Ave. du Bois-de-la-Chapelle, Onex CH 1213, Switzerland, and Jean-Marc Frantz, Schönbuch, Switzerland, assignors to Laszlo Simon, Onex, Switzerland

Filed Dec. 28, 1978, Ser. No. 974,095

Claims priority, application Switzerland, Jan. 6, 1978, 157/78

Int. Cl.³ I25D *3/00*

U.S. Cl. 62—317 **4 Claims**



1. An installation for storing continuously generated cold and for the intermittent release of at least a portion of the stored cold, comprising

(a) a storage container for a mixture of cold water and ice,

(b) an evaporator-crystallizer containing cold water and a liquid cooling medium insoluble in the water, the cooling medium in contact with the water forming floating ice crystals during evaporation,

(c) conduit means for continuously delivering the ice crystals from the evaporator-crystallizer to the storage container to constitute the ice therein,

(d) circulating means for removing cold water from the storage container intermittently, cycling the cold water to an apparatus to be cooled, and then recycling the water from the apparatus back to the storage container, and

(e) a device for thickening the ice-water mixture in the storage container.

4,254,636

HEAT TRANSFER SYSTEM

William H. Zebuhr, Nashua, N.H., assignor to Sunhouse Incorporated, Nashua, N.H.

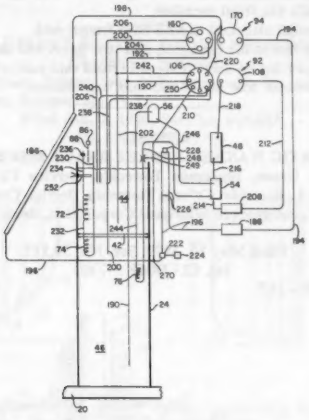
Continuation of Ser. No. 742,346, Nov. 16, 1976, Pat. No. 4,144,999. This application Dec. 27, 1977, Ser. No. 864,324

Int. Cl.³ F25B *29/00*

U.S. Cl. 62—325 **3 Claims**

1. A heat transfer system comprising: a tank section adapted to contain water; a heat exchanger; a condenser having a water passage therein; an evaporator, located in the tank section, adapted to be immersed in the water in the tank section; refrigerant composition flow means for causing refrigerant composition to flow in a closed circuit from the evaporator to the condenser and back to the evaporator; said condenser, evaporator and refrigerant composition flow means forming a heat pump so constituted that heat is extracted by the evaporator from the water in the tank section and is transferred by the condenser from the refrigerant composition to water flowing through the water passage; a pump; a single selector mechanism movable between a first position and a second position; a

common conduit extending from the selector mechanism through the pump, the water passage, and the heat exchanger back to the selector mechanism; an outflow conduit extending between the tank section and the selector mechanism; and a return conduit extending between the tank section and the selector mechanism; and wherein the selector mechanism is so



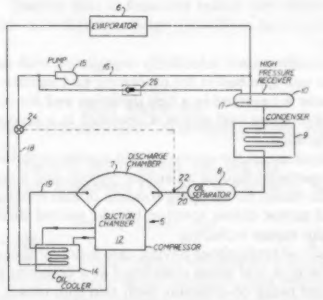
constructed and arranged that when the selector mechanism is in its first position the pump causes water to flow sequentially from the tank section through the outflow conduit, the selector mechanism, the common conduit, the selector mechanism, and the return conduit back to the tank section, and when the selector mechanism is in its second position the pump causes water to flow in a closed loop through the common conduit.

4,254,637

REFRIGERATION SYSTEM WITH REFRIGERANT COOLING OF COMPRESSOR AND ITS OIL

Paul J. Brauch, Muskego, and Paul G. Szymaszek, Milwaukee, both of Wis., assignors to Vilter Manufacturing Corporation, Milwaukee, Wis.

Filed Oct. 19, 1979, Ser. No. 86,587
Int. Cl.³ F25B *43/02*
U.S. Cl. 62—468 **6 Claims**



1. In a refrigeration system comprising a refrigerant compressor that has a head wherein there is a discharge chamber through which compressed refrigerant issues from the compressor, a condensor located substantially remotely from the compressor and through which refrigerant from said discharge chamber flows to be cooled, a high pressure receiver for temporary storage of refrigerant that has passed through the condensor, and an oil cooler through which oil for lubrication of the compressor is circulated to be cooled by indirect heat exchange with another fluid, means for causing substantially all heat that is required to be abstracted from the system to be given off at the condenser, said means comprising:

A. means comprising a pump for withdrawing from the high pressure receiver a portion of the refrigerant that flows thereinto from the condenser and for raising the pressure of such withdrawn refrigerant to above the pressure of refrigerant in said discharge chamber; and

B. duct means associated with said pump for passing said portion of refrigerant

(1) through said oil cooler to serve as said other fluid by which oil is cooled and

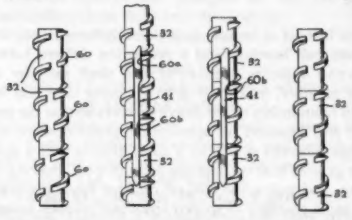
(2) thence into said discharge chamber to be mixed with compressed refrigerant therein for cooling of the compressor.

4,254,638

POSITIVE RELEASE MEANS FOR ARTICULATED FLEXIBLE SHAFT

Michael O. Dressel, Englewood, Colo., assignor to The Bendix Corporation, Englewood, Colo.

Filed Oct. 4, 1978, Ser. No. 948,361
Int. Cl.³ F16C *1/02*
U.S. Cl. 64—2 P **7 Claims**



1. In an articulated flexible shaft assembly and drive means therefor comprising:

a plurality of shaft sections,

connecting means carried on the opposite ends of said shaft sections, said connecting means being interconnected to permit limited angular inclination between said shaft sections,

means interposed between said connecting means of interconnected adjacent shaft sections to effect driving engagement between said shaft sections when one shaft section is rotated relative to the other and for causing said shaft sections to lock up in axially straight alignment when torqued in one direction and to transmit torque in the other direction with limited free angular inclination between said shaft sections,

wherein the improvement comprises:

cam means forming part of said drive means and operatively engageable with each of said shaft sections as it is moved axially through said drive means in a first direction to rotate said shaft sections slightly to positively drive said shaft sections out of radial alignment to permit said limited free angular inclination between shaft sections.

4,254,639

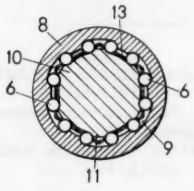
LIMITED SLIDING BALL SPLINE ASSEMBLY

Hiroshi Teramachi, 2-34-8, Higashi-tamagawa, Tokyo, Japan

Division of Ser. No. 819,285, Jul. 27, 1977, Pat. No. 4,176,888. This application Jan. 24, 1979, Ser. No. 6,018
Claims priority, application Japan, Aug. 18, 1976, 51-097774
Int. Cl.³ F16D *3/06*
U.S. Cl. 64—23.7 **3 Claims**

1. A limited sliding ball spline assembly having an outer

sleeve member, a shaft member disposed within said sleeve member and a coupling means including ball bearings for coupling said shaft member to said sleeve member for relative rectilinear movement in an axial direction and in relative torque transmitting relationship, the improvement comprising of said shaft member and said sleeve member each having formed in their respective complementary inner and outer surfaces thereof a plurality of circumferentially spaced longitudinally extending grooves wherein both said sleeve grooves and shaft grooves are sufficiently wide so as to accommodate two spaced apart adjacent rows of ball bearings of said coupling means, and where a row of said ball bearings is common to one of said sleeve grooves and one of said shaft grooves, said respective sleeve grooves and shaft grooves having the sides



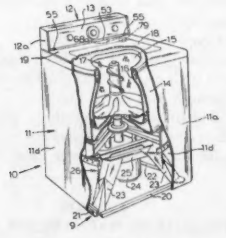
thereof formed to complement a circumferential portion of the adjacent ball bearings and a projection defined between the respective adjacent grooves of said shaft member and said sleeve member, said shaft grooves being disposed in out of phased relationship to the sleeve grooves so that the grooves in one of said members are opposite the projections on said other member whereby a side of a shaft groove and a side of the sleeve groove bear on opposite sides of a ball bearing common thereto, and polygonic shaped retainer having a plurality of faces and a plurality of spaced apart ball retainer holes formed in each face defining a seat for retaining a ball bearing therein, said ball bearing in said row being spaced apart, and longitudinally extending rib for retaining the ball bearings in bearing relationship to the respective sides of the sleeve groove and shaft groove adjacent and common to said ball bearing.

4,254,640

REMOVABLE CABINET FOR FRONT-SERVICABLE APPLIANCES

Robert B. Sherer, and Robert M. Weir, both of St. Joseph Township, Berrien County, Mich., assignors to Whirlpool Corporation, Benton Harbor, Mich.

Filed Sep. 4, 1979, Ser. No. 72,441
Int. Cl.³ D06F *39/12*
U.S. Cl. 68—3 R **3 Claims**



1. In an automatic domestic appliance having internally supported functional components, a cabinet for surrounding said components comprising:

a base frame for supporting said components having upwardly extending tabs thereon and a front member;

a cabinet wrapper having two vertical side panels, a vertical front panel, and a top,

each of said side panels having a bottom flange having apertures therein for receiving said tabs on said base frame for aligning said cabinet wrapper therewith,

said front panel extending in overlapping relationship with said front member and having a bottom flange extending beneath the front member;

a rear panel attached to said base frame; and

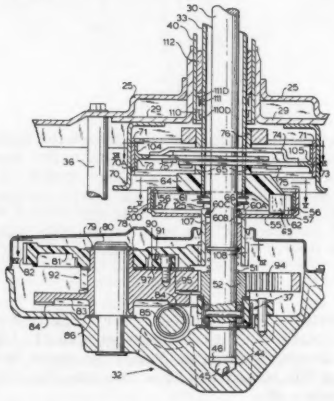
securing means for engaging said rear panel and said cabinet wrapper top to exert tension to hold said cabinet wrapper against said rear panel and said base frame.

4,254,641

AUTOMATIC WASHER BASKET BRAKE MECHANISM

Joseph A. Gauer, Buchanan Township, Berrien County, and William L. Kennedy, Coloma Township, Berrien County, both of Mich., assignors to Whirlpool Corporation, Benton Harbor, Mich.

Filed May 15, 1979, Ser. No. 39,117
Int. Cl.³ D06F *37/40*
U.S. Cl. 68—23.7 **22 Claims**



1. An automatic laundry appliance comprising:

a cabinet;

a rotatable spin basket mounted in said cabinet;

a vertical axis oscillatory agitator mounted in said spin basket;

a reversible motor selectively engageable with said agitator and said spin basket for oscillating said agitator when said motor is operated in a first direction and for rotating said basket when said motor is operated in a second opposite direction;

a control means for operating said appliance through a cycle of operation having an agitate portion and a spin portion;

a brake means for stopping rotation of said spin basket when said motor ceases rotation in said second direction, said brake means including

a pair of brake shoes having cam follower means thereon, each of said shoes connected at a common pivot point and being co-rotatable with said spin basket;

spring means normally biasing said shoes frictionally against a stationary member connected to the appliance to prevent rotation of said spin basket;

a cam rotatable between said brake shoes, said cam bearing against said follower means to overcome said spring bias of said shoes against the stationary member to allow rotation of said spin basket by said motor; and

an automatic rotational direction-responsive drive means selectively engageable with said cam for receiving rotational motion from said motor for co-rotating said cam,

said brake shoes, and said spin basket when said motor is operated in said second direction, and including a means for disengaging said cam upon operation of said motor in said first direction.

4,254,642

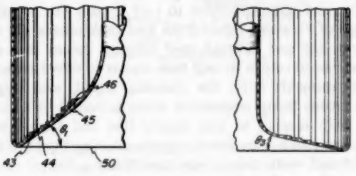
VARIABLE SLOPE BOTTOM BASKET FOR AN ORBITAL CLOTHES WASHER

Vijay K. Stokes, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Jan. 2, 1980, Ser. No. 109,052

Int. Cl.³ D06F *21/06*

U.S. Cl. 68—172 **9 Claims**



1. A basket for an orbital washer comprising an annular outer wall; and a generally cylindrical center post disposed generally concentrically with said outer wall, a basket bottom wall intersecting said outer wall and said center post wherein:

said bottom wall slopes continuously upwardly from the intersection of said bottom wall and said annular outer wall radially inwardly toward said center post;

said bottom wall is shaped to have a slope angle relative to a horizontal reference which varies continuously with circumferential position about said basket bottom wall; and

said annular outer wall includes an internal surface having over a substantial portion of its height extending vertically upwardly from the intersection of said outer wall and said bottom wall a high resistance to relative motion of damp cloth in contact therewith greater than the resistance of the interior surface of said bottom wall to relative motion of the same said damp cloth in contact with said interior surface of said bottom wall.

4,254,643

DOT PRINTER

Mathias Mitter, Falkenstrasse 57, 4815 Schloss Holte, Fed. Rep. of Germany

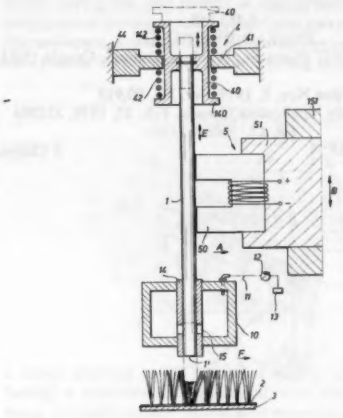
Filed Nov. 28, 1978, Ser. No. 964,783

Claims priority, application Fed. Rep. of Germany, Nov. 30, 1977, 2753295

Int. Cl.³ D06B *1/08*

U.S. Cl. 68—200 **4 Claims**

1. In a dot printer, a combination comprising a plurality of adjacent printing plungers; means mounting said plungers for reciprocation in respective upright paths, including for each of said plungers an annular fixedly mounted member; means retaining each of said plungers in a neutral rest position, including for each of said plungers a sleeve mounted on one end of the respective plungers, extending slidably through a respective one of said annular members and having spaced ends provided with respective flanges, and springs reacting between opposite axial sides of said annular member and the respective flanges for retaining the plunger in said neutral position thereof; drive means performing an oscillating movement in direction lengthwise of said paths; and means for intermittently



coupling selected ones of said plungers to, and for subsequently uncoupling them from said drive means.

4,254,644

APPLICATION OF LIQUID IN MULTIPLE STREAMS TO A MOVING STRIP

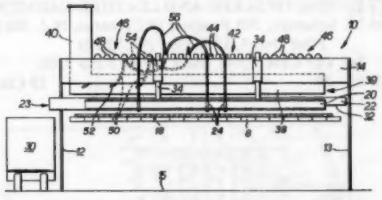
Ian G. Bartlett, Belmont; Arthur D. Barron, Geelong West; Donald A. Lymer, Highton, all of Australia, and George A. R. McKendrick, Port Vila, New Hebrides, assignors to Tybar Engineering Pty. Ltd., Victoria, Australia

Filed May 25, 1979, Ser. No. 42,501

Claims priority, application Australia, May 29, 1978, PD4538; May 29, 1978, PD4539; May 29, 1978, PD4540; Sep. 25, 1978, PD6106

Int. Cl.³ D06B *1/02*

U.S. Cl. 68—205 R **11 Claims**



1. Apparatus for applying liquid to a strip, comprising: a liquid application station; conveyor means for guiding said strip past the application station; means for providing a reservoir of the liquid; an array of multiple openings arranged above and transversely of the conveyor means at said application station; and, disposed in fluid flow lines between the reservoir means and said openings, multiple remote controllable valve means selectively actuable by a programmable electronic control to cause respective streams of liquid when received from said reservoir to issue from the openings onto said strip at the application station in accordance with a predetermined pattern of application of the liquid to the strip; wherein there is further provided a multiplicity of fluid distributors arranged in said fluid flow lines between the valve means and said openings so that each distributor is coupled to one valve means and to a respective group of associated spaced openings of said array, the groups of openings being so arranged in relation to one another that one or more repeats of said pattern occur across

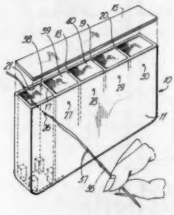
said strip; and wherein the fluid lines connecting the openings of each group to its distributor are of substantially equal length.

4,254,645

THREAD DYEING KIT

Spiro Kouris, 1167 Pierre St., Windsor, Ontario, Canada (N9A 2L3)

Filed Nov. 5, 1979, Ser. No. 90,913
Claims priority, application Canada, Feb. 27, 1979, 322394
Int. Cl.³ D06B *1/10*
U.S. Cl. 68—213 **5 Claims**



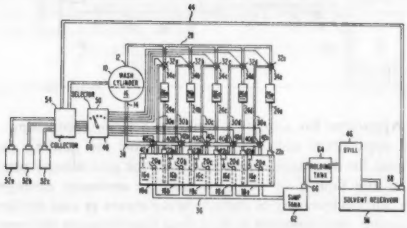
1. A portable thread dyeing kit comprising, in combination,
a generally completely enclosed and sealed container means including a bottom wall, side walls and a top wall,
said container means comprising, interiorly thereof, an integral piece of felt-like absorbent material soaked by a liquid dye, said piece reaching generally up to said top wall;
generally coaxial orifices disposed one in each of said side walls at a point thereof relatively remote from said bottom wall and relatively close to said top wall, said orifices being of the size allowing transverse passage through said container of a sewing needle;
the arrangement of said orifices relative to said integral piece being such that an axis of said orifices extends through a generally solid portion of said integral piece.

4,254,646

APPARATUS FOR CONTINUOUSLY CONTROLLING OF THE CLEANING OF SUEDE AND LEATHER GARMENTS

Michael M. Selesnick, 310 Prospect St., Trenton, N.J. 08618

Filed Oct. 9, 1979, Ser. No. 82,501
Int. Cl.³ C14C *1/00*; D06F *29/00*; F25J *5/00*
U.S. Cl. 69—30 **15 Claims**



1. An apparatus for continuously controlling of the cleaning of suede and leather garments comprising:
(a) a wash means adapted to receive garments to be cleaned therein, said wash means defining an inlet and an outlet therein to receive and expel cleaning liquids;
(b) a plurality of tank means each containing cleaning liquids therein and each being selectively in fluid flow communication with said wash means to supply cleaning liquid thereto, each tank means defining an overflow aperture therein;
(c) a plurality of tank pump means each one being associated with a tank means and adapted to pump the cleaning liquid therefrom;
(d) a plurality of filtering means each one being associated with a tank means and its associated tank pump means, each filter line being connected in fluid flow communication to said tank pump means, each filtering line including a filter means therein adapted to filter contaminants from the cleaning liquid;
(e) a supply line in direct fluid flow communication with said inlet of said wash means;
(f) a plurality of bypass lines in direct fluid flow communication with an associated tank means;
(g) a plurality of bypass valve means each one being associated with a filtering line and in direct fluid flow communication to the end thereof downstream of said filtering means, each bypass valve being connected to an associated bypass line and being connected to said supply line, said bypass valve means being always open to said filtering line and normally open to said bypass line to allow passage of cleaning liquid from said tank means via said filtering line and through said filtering means into said bypass line to return to said tank means to effect removal of contaminants from the cleaning liquid, said bypass valve means being responsive when actuated to become open with respect to said supply line and closed with respect to said bypass line to supply cleaning liquid to said inlet of said wash means from said filtering line;
(h) a drain line in fluid flow communication with said overflow apertures of said tank means to receive overflow of cleaning liquids from said tank means;
(i) a distillation means in fluid flow communication with said drain line to receive cleaning liquid therefrom to distill same and remove solvent therefrom;
(j) a reclaiming line in fluid flow communication with said distillation means to receive reclaimed solvent therefrom;
(k) a return line in fluid flow communication with said outlet of said wash means to receive cleaning liquid therefrom after completion of the washing cycle;
(l) a plurality of return means located within said return line each being associated with a given tank means, said return valves each being normally closed with respect to the associated tank means and being responsive when actuated to open to receive the cleaning liquid returning from said wash means;
(m) a selector means being movable to a plurality of modes of operation wherein each mode corresponds to cleaning of garments within said wash means with one of the cleaning liquids of one of said tank means, said selector means being operably connected to the plurality of said return valve means and each associated bypass valve means, said selectormeans being responsive in a given mode of operation to actuate said corresponding bypass valve means and said corresponding return means to cause washing within that given mode;
(n) a plurality of cleaning additive reservoirs each containing a cleaning additive to be added in varying amounts to the solvent to provide the cleaning liquids in each of said tank means; and
(o) a controller means adapted to receive controlled amounts of cleaning additives from said cleaning additive reservoirs and adapted to receive pure solvent from said reclaiming lines to provide cleaning liquid to said wash means in addition to the cleaning liquid provided thereto through said supply line, said selector means being operably connected to said controller means whereby said controller means is responsive to the mode of operation of said selector means to provide said wash means with a mixture of solvent and cleaning additives corresponding to the cleaning liquid of the current mode of operation thereof, said controller means being operable to inject sufficient additional cleaning liquid to replace that lost in the washing and further additional cleaning liquid to assure some overflow to said overflow aperture of said

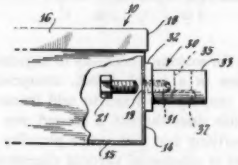
associated tank means to cause flow to said distillation means through said drain line.

4,254,647

FORCE-RESISTANT LOCKING DEVICES

Frederick P. Finck, Jr., Fairfield, Conn., assignor to Highfield Mfg. Company, a Division of Clarkson Industries, Inc., Bridgeport, Conn.

Filed Aug. 7, 1978, Ser. No. 931,364
Int. Cl.³ B65D *55/14*; E05B *65/52*
U.S. Cl. 70—77 **14 Claims**



1. A locking device adapted for combination with electric meter boxes or the like of the type having a bottom, a back wall, side walls, a front wall and a cover hingedly or otherwise attached to the back wall and pivotal to a closed position, the locking device comprising:

(A) a stud member mounted to and extending outwardly from one of the walls other than the back wall of the meter box, the stud member defining a portion of a lock-receiving opening; and

(B) a flange member including an L-shaped angle iron, one leg of the angle iron comprising a flange which overlays a marginal portion of the cover adjacent one of its free edges and the other leg extending downwardly therefrom adjacent the wall of the meter box, and a section of metal stock welded to the downwardly extending leg of the angle iron, the flange member defining a stud-receiving opening through the downwardly extending leg of the angle iron and at least a portion of the metal stock welded thereto whereby the flange member is removably received on the stud member with the stud in the stud-receiving opening, the metal stock defining the remaining portion of the lock-receiving opening which aligns with the portion of the lock-receiving opening defined by the stud member when the stud member and the flange member are assembled together,

whereby the respective portions of the lock-receiving opening together receive and protectively enclose a utility lock of the type having a head, shank and locking balls which are expansible from the shank to engage a shoulder of the lock-receiving opening and thereby retain the utility lock in the lock-receiving opening, and shear strength of the utility lock securing the stud member and flange member together to maintain the electric meter box in its closed condition.

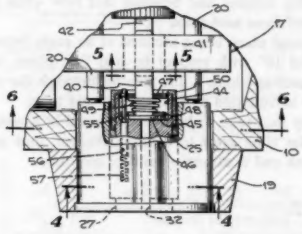
4,254,648

INNER LOCKING CYLINDER WITH CAPTIVE KEY

Hagen Dietrich, Delta, Canada, assignor to Norris Industries, Inc., Long Beach, Calif.

Filed Feb. 21, 1979, Ser. No. 13,229
Int. Cl.³ E05B *11/00*
U.S. Cl. 70—380 **7 Claims**

1. A captive key mechanism for a dead bolt lock wherein the dead bolt lock consists of a latch bolt subassembly with a latch bolt and a rotatable hub for extending and retracting the latch bolt, an outside key actuated trim, and inside key actuated trim, and hub actuating means extending between said trims, and wherein the inside key actuated trim includes a cylinder, a cylinder plug rotatable therein at a shear line and tumblers extendable past the shear line between the cylinder and the cylinder plug, said mechanism comprising means defining a space at the inner end of the cylinder plug, said hub actuating means having one part thereof in engagement with the hub, spring means biasing another part of said hub actuating means into said space, a retainer acting between the cylinder plug and the cylinder for holding the cylinder plug in the cylinder and



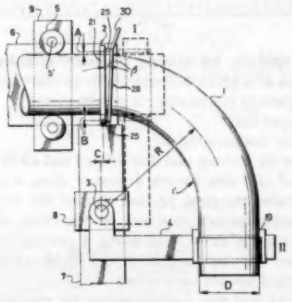
a driver attached to the inner end of the cylinder plug and having a nonrotatable engagement with the retainer, there being circumferentially spaced stop means on the hub actuating means engageable with said driver alternatively in opposite directions of rotation of the cylinder plug for rotating said hub actuating means in response to action of the inside key actuated trim.

4,254,649

TUBE BENDING DEVICE

Juraj Cervenka; Jan Psenica; Miroslav Horak, and Jiri Horak, all of Brno, Czechoslovakia, assignors to Prvni brnenska strojirna, narodni podnik, Brno, Czechoslovakia

Continuation-in-part of Ser. No. 908,369, May 22, 1978, abandoned. This application Feb. 26, 1979, Ser. No. 15,133
Claims priority, application Czechoslovakia, May 31, 1977, 3569-77
Int. Cl.³ B21D *7/16*
U.S. Cl. 72—128 **7 Claims**



1. Apparatus for bending thin walled tubing, comprising:

an annular induction heating coil having an axis disposed in a first plane;

an annular fluid spray cooling coil disposed adjacent said heating coil and having an axis disposed in a second plane and means for directing a coolant fluid toward the space surrounded by said cooling coil closely adjacent said second plane;

means for positioning a tube to be bent so that said tube extends longitudinally through said coils with the portion of said tube corresponding to the outer side of the bend to be made disposed at a clearance distance A from the adjacent inner surface of the heating coil, and the portion

of said tube corresponding to the inner side of the bend to be made disposed at a greater clearance distance B from the adjacent inner surface of the heating coil, the ratio A:B being in the range of about 0.4 to 0.9;

means for pushing said tube through said coils in the direction extending from said heating coil toward said cooling coil;

means for holding and bending said tube upon emergence thereof from said coils;

said second plane being inclined at an angle between about 3° and 10° with respect to said first plane, said planes intersecting along a line passing through the region partially surrounded by the bend of said tube,

whereby said tube to be bent is heated in a wedge-shaped annular zone prior to bending thereof, thus providing a smooth and continuous bend of said tube.

4,254,650

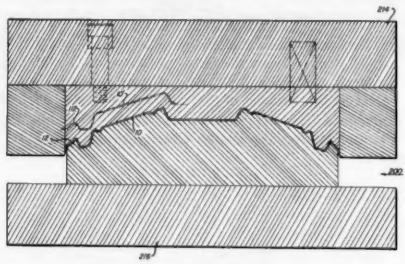
APPARATUS FOR MAKING ALUMINUM WHEEL COVERS

Stanley P. Ash, Greenville, Mich., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Division of Ser. No. 605,037, Aug. 15, 1975, abandoned. This application May 12, 1978, Ser. No. 905,382

Int. Cl.³ B21D *22/00*

U.S. Cl. 72—357 **4 Claims**



1. Apparatus for making generally circular wheel cover members of a given diameter from an aluminum sheet blank, said apparatus comprising, in combination:

an upper die;

a lower cooperating die;

means for moving said dies toward and away from each die;

one of said dies having a groove along a generally outer annular marginal portion thereof for cooperating with complementary structure on the other of said dies for forming a draw bead along a corresponding generally outer annular portion of said blank when said dies are moved toward each other;

wherein said dies include means for providing a predetermined separation between said groove and said complementary structure when said dies form said draw bead and wherein said predetermined separation is significantly greater than the thickness of said blank;

one of said dies further including die structure which is operative after said draw bead is formed to form the central portion of said wheel cover by pulling the central portion of said blank over said die structure as said dies are closed and while said groove and said complementary structure effectively clamp said outer annular portion of said blank so that said central portion of said blank conforms to the surface of said die structure; and,

wherein the diameter of said groove is less than said given diameter.

4,254,651

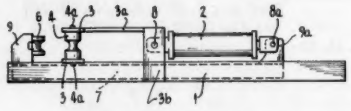
DEVICE FOR BENDING METAL OBJECTS

William R. Kelly, "Lugano", Rugby, New South Wales, Australia (2625)

Filed Feb. 1, 1979, Ser. No. 8,242

Int. Cl.³ B21D *7/06*

U.S. Cl. 72—389 **6 Claims**



1. A device for making a plurality of adjacent bends lying in different planes in a metal object, comprising an elongate frame, a first arm rigidly fixed to said frame, and extending laterally to both sides thereof, a second arm rigidly fixed to said frame overlying said first arm, a plurality of holes in each arm, said holes in substantial vertical alignment, a pair of stop members each having a through-bore, a pin in said bore projecting from both sides thereof, the projecting portions located in a pair of said vertically aligned holes, to thereby position each said stop member; a hydraulic ram fixed to said frame to extend and retract lengthwise thereof, and having its piston rod projecting from the end of the ram furthest from said arms, a link extending lengthwise of said frame, beneath said ram and said first arm, said link having an upwardly extending lug portion at each of its ends, one lug portion being connected to the end of said piston rod, and the other lug portion mounting a former, the upper end of said former being free of said frame and said arms, when the bent metal object is removed from said device, the arrangement being such that on each extension of said ram, said former moves towards said arms, whereby to make a bend in said object held between said former and said stop members, the ends of said object moving away from said arms and said frame during successive bending operations on said object, and on each retraction of said ram, said former moves away from said arms and said object comes away from said stop members.

4,254,652

IRONING DIE FOR IRONING PRESS

Harry P. Proctor, Minneapolis, Minn., assignor to National Can Corporation, Chicago, Ill.

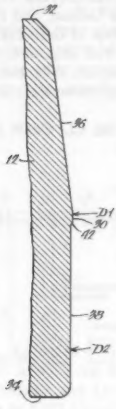
Continuation-in-part of Ser. No. 915,611, Jun. 15, 1978, abandoned. This application Jun. 4, 1979, Ser. No. 43,881

Int. Cl.³ B21C *3/02*

U.S. Cl. 72—467 **5 Claims**

1. An ironing die for use with a punch to reduce the wall thickness of the sidewall of a metal cup, comprising a body having a circular opening therein extending from a leading surface to a trailing surface which are substantially parallel to each other, said opening having a land spaced from said surfaces defining a minimum diameter, said opening having a

cylindrical portion between said land and said trailing surface having a diameter in the range of about 1.0003 to about 1.0012



times said minimum diameter to guide said cup after a free edge moves past said land.

4,254,653

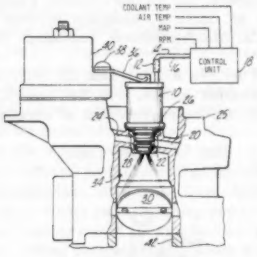
ELECTROMAGNETIC FUEL INJECTOR CALIBRATION

Gary L. Casey, Troy; Albert Blatter, Southfield; John A. Miller, Auburn Heights, and William B. Claxton, West Bloomfield, all of Mich., assignors to The Bendix Corporation, Southfield, Mich.

Division of Ser. No. 956,692, Nov. 1, 1978. This application Jan. 11, 1980, Ser. No. 111,426

Int. Cl.[3] G01F *25/00*

U.S. Cl. 73—3 **3 Claims**



1. A method of calibrating the static and dynamic fuel flow characteristics of an electromagnetic injector valve after assembly comprising the steps of:

providing an electromagnetic injector valve with an independently adjustable means for controlling valve lift and an independently adjustable means for controlling closure force after assembly;

measuring the static fuel flow of the injector valve with the valve open;

calibrating the static fuel flow by adjusting the lift of the valve and thereby changing the air gap;

measuring the dynamic flow of the injector; and

calibrating the dynamic fuel flow by adjusting the closure force to produce a desired opening and closing time with respect to said air gap.

4,254,654

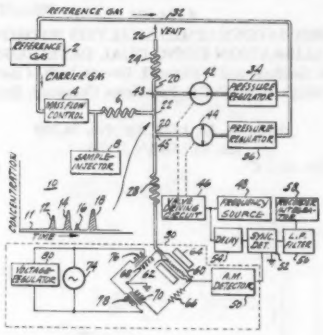
MODULATED FLUID DETECTOR

David E. Clouser, Wilmington, Del., and John S. Craven, West Grove, Pa., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Oct. 7, 1976, Ser. No. 730,559

Int. Cl.[3] G01N *31/08*

U.S. Cl. 73—27 R **14 Claims**



1. In combination

a thermal conductivity cell comprising means defining a cavity and a filament mounted therein,

means for heating said filament,

means adapted to cause alternate flows of reference fluid and a mixture of carrier and sample fluids through said cavity at a given frequency,

means for deriving an electrical signal from said filament that corresponds to the instantaneous power drawn from said filament by the alternate presence in the cavity of said reference fluid and the fluid that is a mixture of said carrier and sample fluids and

means for deriving an output signal proportional to the peak to peak amplitude of said electrical signal.

4,254,655

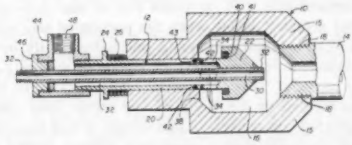
HYDRAULIC FILL VALVE

Larry G. Keast, Houston, Tex., and Herbert D. Horton, Mayhill, N. Mex., assignors to World Wide Oil Tools, Inc., Houston, Tex.

Filed Oct. 9, 1979, Ser. No. 82,978

Int. Cl.[3] G01M *3/02*

U.S. Cl. 73—49.5 **8 Claims**



1. An apparatus for supplying fluid for hydraulic testing of pipe comprising:

housing means sealingly connectible to a pipe to be hydraulically tested, said housing means possessing an internal chamber which communicates with the interior of said pipe when said housing means and pipe are connected;

valve means within said housing means for admitting a first hydraulic fluid for hydraulic testing into said chamber of said housing means;

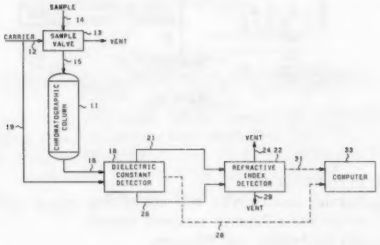
valve control means for opening or closing said valve means; and

conduit means within said valve means for admitting a second hydraulic fluid for hydraulic testing into said chamber of said housing means, said second hydraulic fluid admitted by said conduit means being under greater hydraulic pressure than said first hydraulic fluid admitted into said chamber by said valve means.

4,254,656
CHROMATOGRAPHIC ANALYSIS WITHOUT CALIBRATION USING DUAL DETECTORS

Richard A. Sanford, and William H. Dennis, both of Bartlesville, Okla., assignors to Philips Petroleum Company, Bartlesville, Okla.

Filed Sep. 12, 1979, Ser. No. 74,709
Int. Cl.³ G01N *31/08*
U.S. Cl. 73—61.1 C **8 Claims**



1. Apparatus for obtaining an analysis of the concentration of a substantially non-polar component of a material comprising:

a chromatographic separation column means;

means for passing a stream of a carrier fluid, which is substantially polar, to said chromatographic separation column means;

means for injecting a sample of said material into said stream of said carrier fluid flowing to said chromatographic separation column means;

a dielectric constant detector means;

a refractive index detector means;

means for passing the stream of said carrier fluid containing separated components of the sample of said material from said chromatographic separation column means to said dielectric constant detector means as a sample stream;

means for passing a stream of said carrier fluid to said dielectric constant detector means as a reference stream, said dielectric constant detector means providing a first signal representative of the response E_{DC} of said dielectric constant detector means when the portion of said stream of said carrier fluid containing said substantially non-polar component and the reference stream of said carrier fluid are provided to said dielectric constant detector means;

means for passing the stream of said carrier fluid containing separated components of said sample of said material from said chromatographic separation column means to said refractive index detector means as a sample stream;

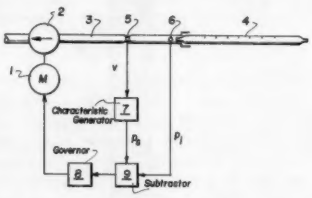
means for passing a stream of said carrier fluid to said refractive index detector means as a reference stream, said refractive index detector means providing a second signal representative of the response E_{RI} of said refractive index detector means when the portion of said stream of said carrier fluid containing said substantially non-polar component and the reference stream of said carrier fluid are provided to said refractive index detector means; and

means for establishing the concentration of said substantially non-polar component in response to said first signal and said second signal.

4,254,657
GAS DETECTOR AND METER EMPLOYING INDICATOR TUBES

Kurt Leichnitz, Gross Grönau, and Peter Naumann, Stockelsdorf, both of Fed. Rep. of Germany, assignors to Drägerwerk Aktiengesellschaft, Fed. Rep. of Germany

Filed May 23, 1979, Ser. No. 41,805
Claims priority, application Fed. Rep. of Germany, May 29, 1978, 2823315
Int. Cl.³ G01N *1/24*
U.S. Cl. 73—421.5 R **7 Claims**

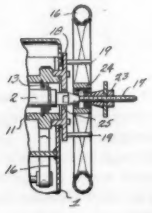


1. A method of insuring reproducible results in testing gas of the type in which the gas is passed through a detection tube containing a measuring substance by a pump having an electrical motor with a speed governor connected thereto for regulating the pump speed, comprising the steps of passing the gas to be tested through the tube, sensing the gas volume being moved through the tube, converting the volume sensed to a desired pressure signal, sensing the actual pressure in the tube and forming an actual pressure signal, applying the desired pressure signal plus the actual pressure signal to a subtractor to form a differential pressure signal, and connecting the subtractor to the speed governor so that a differential signal from the subtractor controls the suction of the pump by equalizing the actual pressure with the desired pressure.

4,254,658
APPARATUS FOR BALANCING OF ROTORS

Horst Kogler, Dieburg, and Eickhart Goebel, Pfungstadt, both of Fed. Rep. of Germany, assignors to Gebr. Hofmann G.m.b.H. & Co., Maschinenfabrik, Darmstadt, Fed. Rep. of Germany

Continuation of Ser. No. 872,111, Dec. 22, 1977, abandoned. This application Jun. 18, 1979, Ser. No. 49,786
Claims priority, application Fed. Rep. of Germany, Jan. 18, 1977, 2701876
Int. Cl.³ G01M *1/22*
U.S. Cl. 73—462 **9 Claims**



1. An apparatus for balancing rotors comprising:

a frame;

a locally fixed axle;

a driving motor;

means for supporting said axle on said frame and for rigidly connecting said axle and motor;

a hub rotatably mounted about said fixed axle;

means for connecting said hub and motor for rotating said hub;

means for clamping a rotor to be balanced on said apparatus so that said rotor is rotated by said hub wherein said clamping means includes at least one drive pin for engaging spokes of a rotor to be balanced; and

a plurality of data receivers for engaging said axle to produce signals indicating the unbalance of said clamped rotor.

4,254,659

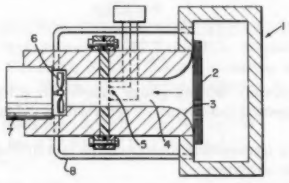
FLUID DYNAMIC ANGULAR RATE SENSOR

Kenneth R. Benedetto, Medway, and Larry J. Linder, Dayton, both of Ohio, assignors to KBG Corporation, Medway, Ohio

Filed Jan. 12, 1979, Ser. No. 3,490

Int. Cl.³ G01P *15/00*

U.S. Cl. 73—516 LM **6 Claims**



1. A unit for sensing the direction and rate of angular movement of a body comprising: a fluid flow channel including a short section of pipe, a flow inlet plenum connected longitudinally to one end of the flow-channel and providing a means for dampening out inhomogenieties and disturbances in pressure of the fluid flow which enters the inlet region of said fluid flow channel, a fluid flow-sensing means which respond to differences in fluid flow velocity across a diameter of said flow channel and are mounted to a fixture which is connected longitudinally to the end of said flow channel opposite said inlet plenum and with said sensing means positioned symmetrically about the longitudinal axis of said flow channel, a mounting block fixture to which parts including said inlet plenum, flow channel, and sensing means are attached and providing a base mounting for a fluid pumping means which is incorporated for the purpose of establishing a low velocity, uniform, laminar flow of fluid nearly across the entire diameter of said flow channel in a velocity direction into said inlet plenum, longitudinally through said flow channel, and exhausting into the ambient environment and alternately returned through pipes to said inlet plenum through ports in said mounting block fixture such that under conditions of angular movement in a plane which includes a diameter of said flow channel which passes centrally through the sensing means and the longitudinal axis of said flow channel, the distribution of fluid flow rate across said flow channel diameter becomes unsymmetrical proportional to the applied angular movement and the said sensing means respond proportionally to the said induced unsymmetric flow about the same channel diameter, the sensing means thus producing measurable output signals proportional to rate and direction of angular movement.

4,254,660

ULTRASONIC TEST METHOD AND APPARATUS WITH COUPLING LIQUID TEMPERATURE COMPENSATION

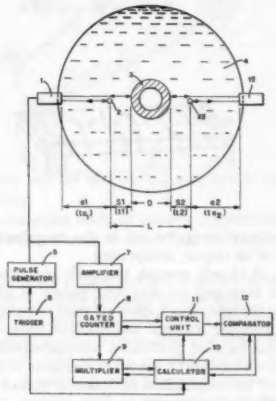
Reinhard Prause, St. Augustin, Fed. Rep. of Germany, assignor to Krautkramer-Branson, Inc., Stratford, Conn.

Filed Nov. 19, 1979, Ser. No. 95,344

Claims priority, application Fed. Rep. of Germany, Jan. 19, 1979, 2902017

Int. Cl.³ G01N *29/00*

U.S. Cl. 73—597 **8 Claims**



1. The method for compensating for the temperature responsive changes of the acoustic velocity in a liquid used in an ultrasonic test system wherein cyclically an ultrasonic search signal is transmitted from an ultrasonic transducer through a liquid coupling medium to a workpiece and the echo signals arising from reflections of the search signal at the workpiece surfaces are used for evaluating the workpiece dimensions and wherein along the search signal path from said transducer to the workpiece an auxiliary reflector is disposed at a fixed distance from said transducer, the steps comprising:

periodically transmitting a further search signal from said transducer along said signal path and receiving echo signals arising from said further signal being reflected along said path;

providing a first output value responsive to the transit time of said further search signal traversing said fixed distance from said transducer to said reflector;

multiplying said first output value by an acoustic velocity value of the liquid medium obtained during a calibration procedure to thereby obtain a second output value;

multiplying said second output value by a stored compensation factor to obtain a third output value;

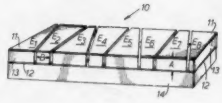
comparing said third output value with a stored distance value representing said fixed distance and obtained during a calibration procedure and updating said stored compensation factor responsive to any difference between said third output value and said stored distance value, and

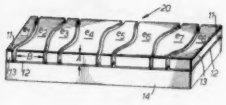
storing said updated compensation factor and utilizing it in succeeding search signal transmissions used for evaluating the workpiece dimensions until a subsequent further search signal causes once again updating of said compensation factor.

4,254,661
ULTRASONIC TRANSDUCER ARRAY

George Kossoff, and David A. Carpenter, both of Northbridge, Australia, assignors to The Commonwealth of Australia, Phillip, Australia

Filed Apr. 19, 1979, Ser. No. 31,528
Claims priority, application Australia, Apr. 19, 1978, 4109/78
Int. Cl.[3] G01N *29/04*
U.S. Cl. 73—625 9 Claims





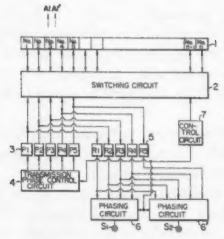
1. A transducer array for use in the megahertz ultrasonic examination of an object, comprising

a plurality of closely spaced, generally elongate transducer elements arranged for directing pulses of ultrasonic energy into the said object, each element comprising a piezoelectric ceramic material sandwiched between a pair of planar and parallel electrodes, characterized in that the width of each of said transducer elements in the direction transverse its longitudinal direction is non-uniform along the length of the element.

4,254,662
MULTIPLE ACOUSTIC BEAMFORMER STEP SCANNER

Masao Kuroda, Tokyo; Sekijyuro Ono, Hamuramachi; Kageyoshi Katakura, Tokyo, and Toshio Kondo, Kunitachi, all of Japan, assignors to Hitachi Medical Corporation, Tokyo, Japan

Filed Aug. 24, 1978, Ser. No. 936,523
Claims priority, application Japan, Sep. 2, 1977, 52-105678
Int. Cl.[3] G01N *29/00*
U.S. Cl. 73—626 15 Claims

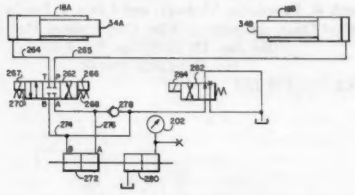


1. An ultrasonic imaging system comprising an array of plural ultrasonic oscillators adapted to transmit first ultrasonic waves and to receive second ultrasonic waves derived from said first ultrasonic waves, switching means for sequentially selecting for transmission and reception a plurality of oscillator sets in the oscillator array so that at least two receiving oscillator sets having at least some oscillators in common are selected for a single transmission of the first ultrasonic waves to receive the second ultrasonic waves for production of at least two successive scan lines, and phasing means associated with the outputs from the oscillators in each set of said at least two selected receiving oscillator sets for phase-adjusting the respective oscillator output signals so that the second ultrasonic waves received by said at least two selected receiving oscillator sets effectively correspond to ones substantially emanating from at least two respective different points on a depth level distanced from the plane of the oscillator array by a predetermined depth during the single transmission of the first ultrasonic waves, thereby providing at least first and second output signals relating to the second ultrasonic waves from said at least two respective different points to produce said at least two successive scan lines.

4,254,663
METHOD AND APPARATUS FOR PRESSING WHEELS AND OTHER MEMBERS ONTO AND OFF OF AN AXLE

Jack A. Rickrode, and Charles W. Frame, both of Chambersburg, Pa., assignors to Chambersburg Engineering Company, Chambersburg, Pa.

Division of Ser. No. 971,058, Dec. 19, 1978, Pat. No. 4,214,363.
This application Nov. 23, 1979, Ser. No. 96,804
Int. Cl.[3] G01L *7/16*
U.S. Cl. 73—714 3 Claims



1. A pressure sensing gauge system for a hydraulic press having opposed fluid actuated rams within cylinders, comprising:

pressure transmitting lines from the ram driving end of each of the cylinders,

a valve positionable to cause connection of the lines such that the high pressure will always be connected to a fixed output port,

means determining the position of the valve in accordance with pressure conditioning in the system,

a differential pressure cylinder having a piston having at least an output piston rod,

lines connecting the high and low pressure output ports to opposite sides of the piston in said differential cylinder,

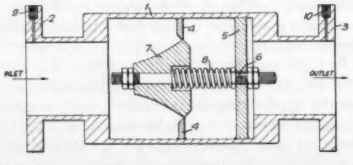
a differential pump constructed to generate a pressure proportional to the thrust of the differential cylinder's piston rod, and

pressure indicator connected to the output of the differential pump and responding to indicate the differential pressure.

4,254,664
FLOW METERS

Ian G. Graham, Sussex, England, assignor to Gervase Instruments Limited, Surrey, England

Filed Aug. 3, 1979, Ser. No. 63,202
Int. Cl.[3] G01F *1/22*
U.S. Cl. 73—861.58 3 Claims



1. A fluid flow meter comprising

a flow tube having fluid flow input and fluid flow output means, said tube having a peripheral wall defining a generally circular flow cross-section,

a round measuring orifice provided in said tube between said input and output means,

a contoured plug slidably mounted on an axial slide in said orifice, said plug being of curvilinear tapering cross-section with the curvature of the contouring being such as to produce a linear relationship between differential pressure across an annulus formed by the coincidence of said plug and said orifice and between the flow through said annulus, said tapering cross-section and said orifice forming an annulus of area a, and said tapering cross-section being determined by means of the formula:

$$\frac{Cx = K\pi y^2 A^2 (a - \pi y^2)^2}{A^2 - (a - \pi y^2)^2}$$

where x is the axial dimension of said plug from its closed position in said orifice, y is the radius of said plug at said orifice, and A is the internal area of said tube upstream of said orifice,

biasing means urging said plug toward said inlet so as to close said orifice when there is no fluid flow, and

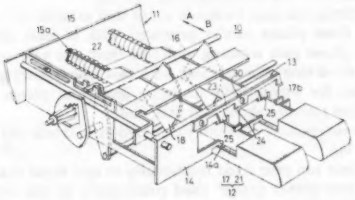
fluid flow indicating means serving to indicate the fluid flow through said flow tube.

4,254,665

PUSH-BUTTON TYPE TUNING APPARATUS

Toshio Aoki, Yokohama; Atsumi Takayama, Hachiohji; You Matsuuchi, Kawasaki; Mikito Baba, Yokohama, and Kenichiro Kawazoe, Fuchu, all of Japan, assignors to Mitsumi Electric Co., Ltd., Chofu, Japan

Filed Apr. 3, 1979, Ser. No. 26,758
Int. Cl.³ F16H *35/18;* G05G *1/02*
U.S. Cl. 74—10.33 **4 Claims**



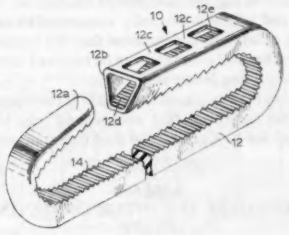
1. A push button type tuning apparatus comprising: a frame structure having a pair of front and rear support plates opposing each other across an interval, each of said support plates having a plurality of in line support openings formed therein; a plurality of slidable push buttons each comprising a slide plate fitted into said support openings in said support plates, a button provided at one end of said slide plate projected from the front support plate, and a projection provided on the slide plate between the front support plate and the push button; a resilient restriction member provided on the front support plate on the side confronting said projection, said resilient restriction member having a plurality of leaf spring lugs cut and raised to a predetermined angle, said leaf spring lugs being resiliently deformed to undergo resilient displacement by said projection prior to said push button reaching a position to select a station, said resilient restriction member further having a mounting part for mounting on the front support plate, said resilient restriction member being deformed by the projection upon sliding of the push button and pushing the slide plate of the push button against one edge of the support openings.

4,254,666

ADJUSTABLE V-BELT

William D. Seredick, 581 NW. 40th Ct., Ft. Lauderdale, Fla. 33309

Filed Jan. 22, 1979, Ser. No. 5,281
Int. Cl.³ F16G *7/06*
U.S. Cl. 474—253 **2 Claims**



1. A flexible belt for connecting together at least two pulleys, comprising:

a flexible elongated body of unitary construction,

the body having a cross-section shape in the form of a trapezoid,

the body having a female end and a male end, said male end being interlockable into said female end,

the female end having an opening and a chamber, said female end chamber having a cross-sectional shape in the form of a trapezoid, said shorter parallel wall of said chamber having a plurality of teeth laterally disposed thereon,

said longer parallel wall of said female chamber having a plurality of apertures disposed therethrough sized to selectively receive the male free end of said belt,

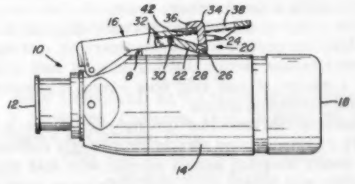
said male end of said belt member having a trapezoidal cross-sectional shape, said male end being tapered in height diminishing to a smaller thickness, said male end having a plurality of inclined interlockable teeth disposed along the shorter parallel side whereby said male end may be inserted into the female end opening and chamber and adjusted in length until it is interlocked with the inclined teeth of the female end and exists through one of said apertures.

4,254,667

SAFETY THROTTLE FOR POWER TOOLS

Daniel T. Wong, Columbia, S.C., assignor to Rockwell International Corporation, Pittsburgh, Pa.

Filed Feb. 5, 1979, Ser. No. 9,456
Int. Cl.³ G05G *1/04;* B23B *45/00*
U.S. Cl. 74—526 **3 Claims**



1. A safety throttle assembly for use with powered tools having a motor and a motor housing, said assembly comprising:

(a) an operating lever having an elongated opening located adjacent one end thereof, said lever being pivotally at-

tached to the main housing on the end opposite said slot; and

(b) safety latch means associated with said operating lever whereby the tool throttle cannot be operated accidentally, said safety latch means including:

(i) a first leg pivotally connected at one end to said operating lever on that side facing the tool housing;

(ii) a second leg pivotally connected to the remaining end of said first leg, the outer end of said second leg opposite that and which is pivotally connected to said first leg being of less lateral dimension than the remainder of the leg so that said outer end can be received into the slot of said operating lever; and

(iii) spring biasing means mounted on the hinged connection between said first and second legs to bias said second leg to a position of tool inoperativeness.

4,254,668

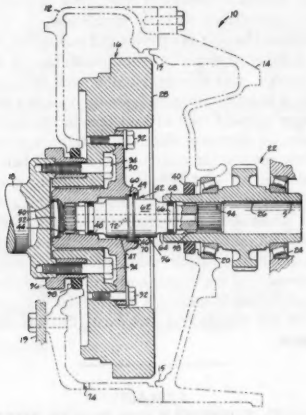
ENGINE FLYWHEEL AND INTERCONNECTING DRIVE SHAFT

Orville E. Kessinger, and Ivan R. Lamport, both of Peoria, Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Continuation of Ser. No. 816,627, Jul. 18, 1977, abandoned. This application Jan. 11, 1979, Ser. No. 2,625

Int. Cl.³ G05G *1/00, 3/00*

U.S. Cl. 74—572 **6 Claims**



1. A drive connection comprising:

a housing having a first portion and a second portion, said second portion removably associatable with said first portion;

a drive shaft rotatably mounted in said first portion of the housing;

a flywheel first portion removably affixed said drive shaft and rotatable in said housing;

an axially socketed second portion axially disposed in said flywheel first portion for rotation therewith, said axially socketed second portion defining an axial bore with at least a portion of said axial bore having a plurality of inwardly extending splines;

a symmetric splined drive shaft drivingly positionable in said axially socketed second portion for drivingly connecting said axially socketed second portion with said second assembly, said splined drive shaft defining an axial bore therethrough;

retention means for fixedly retaining said drive shaft in said axially socketed second portion;

cap means for sealing the end of the axial bore of the axially socketed second portion adjacent the drive shaft; and

a first seal member disposed about said splined drive shaft interior of the axial bore of said axially socketed second portion;

said second portion of said housing including a source of lubricant, said splined drive shaft defining an enlarged center portion forming a shoulder generally at the midpoint thereof, said shoulder circumferentially surrounding said splined drive shaft and positionable in said axial bore of socketed second portion, said axial bore of said splined drive shaft for communicating lubricant from said second assembly to said axial bore of said socketed second portion.

4,254,669

TUBE-SHAFT PLANETARY-GEAR TRANSMISSION

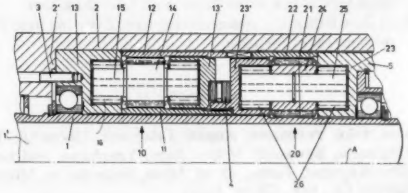
Horst Schulz, Friedrichshafen, Fed. Rep. of Germany, assignor to Zahnradfabrik Friedrichshafen Aktiengesellschaft, Friedrichshafen, Fed. Rep. of Germany

Filed Jun. 29, 1979, Ser. No. 53,279

Claims priority, application Fed. Rep. of Germany, Jul. 5, 1978, 2829502

Int. Cl.³ F16H *37/06, 1/28;* **E21B** *4/00*

U.S. Cl. 74—705 **7 Claims**



1. A shaft transmission comprising:

an input shaft defining a transmission axis;

an output shaft coaxial with said input shaft;

a front planetary assembly centered assembly centered on said axis and including

a front sun gear rotatable about said axis,

a front planet carrier provided with at least one front planet gear meshing with said front sun gear, and

a front ring gear meshing with said front planet gear;

means for substantially arresting said front planet carrier from rotating about said axis; and

a rear planetary assembly centered on said axis and including

a rear sun gear fixed rotationally to said input shaft,

a rear planet carrier fixed rotationally to said front sun gear and to said output shaft and provided with at least one rear planet gear meshing with said rear sun gear, and

a rear ring gear fixed rotationally to said front ring gear and meshing with said rear planet gear.

4,254,670

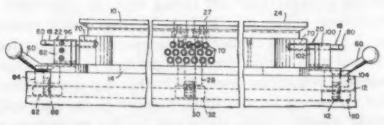
WORK TABLE LOCATING DEVICE

Roman Lazarchuk, 6810 Rosemont, Detroit, Mich. 48228

Filed Aug. 31, 1978, Ser. No. 938,412

Int. Cl.³ B23Q *17/04*

U.S. Cl. 74—815 **5 Claims**



4. Apparatus for performing machining operations compris-

ing a table for supporting a workpiece, means mounting said table for rotation, means for indexing said table to selected rotative positions, said indexing means comprising a plurality of holes in said table in spaced relation about the periphery thereof, an indexing pin engageable in any one of said holes, an indexing block having a prong provided with an abutment surface in the path of said pin when said pin is engaged in any one of said holes and said table is rotated, whereby said pin when engaged in a particular hole will contact said abutment surface and locate said table in a selected rotative position, said means for indexing said table also including a second indexing pin engageable in any one of said holes, and a second indexing block having spaced prongs which are spaced apart a distance approximating the width of said second pin and disposed in the path of said second pin when said second pin is engaged in any one of said holes and said table is rotated so that said second pin may extend between the prongs of said second indexing block, and means for releasably retaining said table against rotation from a selected rotative position.

4,254,671

METHOD AND SYSTEM FOR UPSHIFTING AN AUTOMATIC TRANSMISSION

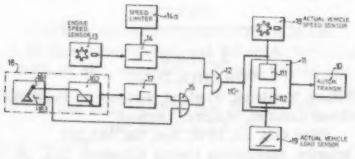
Joseph Sauer, Schwieberdingen; Volker Kadelbach, Freiberg, and Gerhard Will, Weinstadt, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Feb. 28, 1978, Ser. No. 882,138

Claims priority, application Fed. Rep. of Germany, Mar. 3, 1977, 2709235

Int. Cl.³ B60K *41/10*

U.S. Cl. 74—866 **5 Claims**



1. In automotive vehicles having desired load signal furnishing means (**16**) for furnishing a desired load signal, and an internal combustion engine having an automatic transmission operative in part in accordance with upshift curves specifying upshift control speeds signifying vehicle speeds requiring upshift, engine speed signal furnishing means (**13, 14**) operative independently of said automatic transmission for furnishing a limiting speed signal indicative of maximum permissible engine speed, and speed limiting means (**14***a*) for limiting the speed of said engine at least in part under control of said limiting speed signal:

a method for furnishing an upshift signal to said automatic transmission, comprising the steps of

furnishing a full-load signal when said desired load signal is indicative of desired full load; and

furnishing said upshift signal in response to simultaneous presence of said full-load signal and said limiting speed signal, so that an upshift will occur at full load even when said vehicle speed is less than said upshift control speed.

4,254,672

CONTROL SYSTEM FOR A STEPLESS VARIABLE SPEED TRANSMISSION

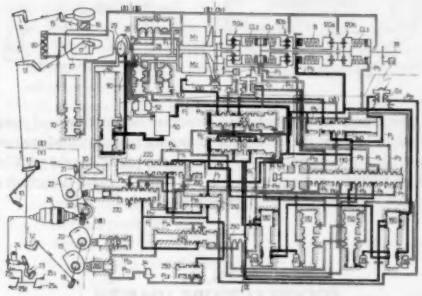
Kiyofumi Mizuno; Masanori Sato, both of Nagoya; Hiroaki Maeda, Toyota; Shigeo Takahashi, Kariya, and Satomi Suzuki, Nagoya, all of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Mar. 26, 1979, Ser. No. 23,993

Claims priority, application Japan, Mar. 27, 1978, 53-35767

Int. Cl.³ B60K *41/04, 41/12*

U.S. Cl. 74—869 **6 Claims**



1. A control system for a stepless variable speed transmission including a drive train between an input shaft and an output shaft and having at least two speed ratio ranges which are selectively completed by a switching operation of the power transmission control means such as clutch or brake and wherein a speed ratio in each range is controlled by controlling the supply of a hydraulic fluid to a speed ratio controlling actuator; the control system comprising an up shift valve means to which a speed ratio increasing hydraulic pressure applied to the actuator and a hydraulic pressure of the power transmission control means in the low speed ratio range are applied in opposing relationship and which switches a hydraulic pressure of the power transmission control means in the high speed ratio range when the speed ratio increasing hydraulic pressure exceeds a given value, a down shift valve means to which a speed ratio decreasing hydraulic pressure applied to the actuator and a hydraulic pressure of the power transmission control means in the high speed ratio range are applied in opposing relationship and which switches a hydraulic pressure of the power transmission control means in the low speed ratio range when the speed ratio decreasing hydraulic pressure exceeds a given value, and a directional control valve means to which the hydraulic pressure of the power transmission control means in the low speed ratio range and the hydraulic pressure of the power transmission control means in the high speed ratio range are applied in opposing relationship to drive the control valve means in accordance with a pressure difference therebetween to thereby reverse the direction in which the speed ratio increasing and the speed ratio decreasing hydraulic pressure is applied to the actuator.

4,254,673

SAW MOUNTED SAW CHAIN SHARPENER

Jack F. Simington, Chiloquin, Oreg., assignor to Simington Products Co., Chiloquin, Oreg.

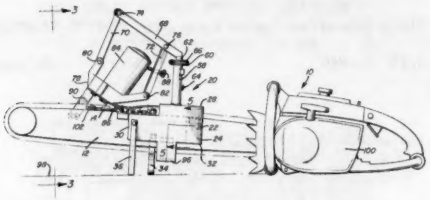
Filed May 29, 1979, Ser. No. 43,237

Int. Cl.³ B23D *63/16*

U.S. Cl. 76—25 A **9 Claims**

1. In combination, a mount, means on said mount for supporting a saw chain in predetermined position relative to said mount, a support, a rotary grinding wheel journaled from said support, and parallelogram linkage structure operatively connecting said support and mount for relative swinging to bring

the periphery of said wheel, and a saw chain tooth in predetermined position on said mount, into engagement with each other along a path extending generally radially of said wheel and with the axis of rotation of said wheel relative to said mount spaced to one side of a plane in which said tooth is



disposed, said mount including structure supporting said parallelogram linkage therefrom for swinging angular displacement about an axis substantially paralleling the plane of said parallelogram linkage and extending in the same general direction as the axis of rotation of said grinding wheel.

4,254,674

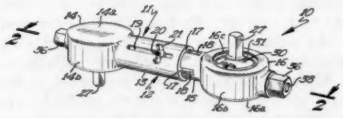
SOCKET SUPPORT ADAPTER

Thomas Strussion, 4999 Jefferson St., and Kermit H. Sweigart, Box 63C, R.D. #3, both of, Bellaire, Ohio 43906

Filed Jun. 7, 1979, Ser. No. 46,438

Int. Cl.[3] B25B *17/00*

U.S. Cl. 81—57.3 **4 Claims**



1. A socket support adapter comprising:

a body including a pair of telescoping body sections each including an elongate sleeve portion having a generally cylindrical housing affixed to one end thereof, the sleeve portions being longitudinally extensible and retractable with respect to each other,

an elongate shaft comprising a pair of elongate telescoping shaft sections journaled in said body for rotation relative thereto, said shaft sections being longitudinally extensible and retractable with respect to each other when said body sections are longitudinally shifted,

a pair of gears each being secured to one of said shaft sections for rotation therewith and each gear being positioned interiorly of one of said housings,

a pair of substantially identical male socket elements each being journaled in one of said housings for rotation relative thereto, said male socket elements being disposed substantially normal to the longitudinal axis of said shaft and each male socket element projecting exteriorly of its associated housing in a direction opposite of the other male socket element, each male socket element being shaped and dimensioned to engage a female socket element or the adapter element of a drive ratchet,

a pair of gears positioned interiorly of one of said housings and each being secured to one of said male socket elements for rotation therewith, the gear on each male socket element meshing with one of the gears on said shaft whereby when one of the said male socket elements is rotated in a predetermined direction, the other socket element will be rotated in the same direction.

4,254,675

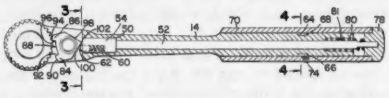
REVERSIBLE RATCHET WRENCH

James T. Marlow, Box 36, Rte. 1, Evensville, Tenn. 37332, and Carroll M. Bridges, 1637B Hamlet Dr., Chattanooga, Tenn. 37421

Filed Oct. 17, 1979, Ser. No. 85,714

Int. Cl.[3] B25B *13/46*

U.S. Cl. 81—63 **13 Claims**



1. A reversible ratchet wrench having a body member including a socket receiving portion at one end and a handle portion longitudinally spaced therefrom, and a socket member including a ratchet wheel rotatable in said socket receiving portion, pawl means including a pair of oppositely disposed pawl members, journal means for pivotably mounting said pawl means for cooperative engagement of said pawl members with said ratchet wheel, each pawl member having wheel engaging and disengaging positions, and reversing means for turning said pawl means to position selectively one of said pawl members in said wheel engaging position and the other of said pawl members in said disengaged position for permitting rotation of said wheel in one direction, said reversing means comprising a control rod longitudinally journaled in said body member for rotation relatively thereto, presser means eccentrically carried by said control rod and disposed in engagement with said pawl means for turning said pawl means in a first direction to engage said one pawl member with said wheel and in the opposite direction to engage said other pawl member with said wheel in response to the rotational position of said rod, a barrel disposed about said handle portion and axially movable relatively thereto, coupling means for rotatably securing said barrel to said handle portion in a first axial position and for permitting rotation of said barrel in a second axial position, and means for rotatably securing said control rod to said barrel, whereby operator influenced movement of said barrel to said second axial position and subsequent rotation thereof rotationally repositions said rod to turn said pawl means.

4,254,676

WORKHOLDING

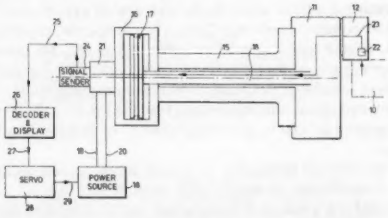
Bernard Wilson, Eastleigh, England, assignor to Pratt Burnerd International Limited, Halifax, England

Filed Oct. 20, 1978, Ser. No. 953,297

Claims priority, application United Kingdom, Oct. 29, 1977, 45124/77

Int. Cl.[3] B23B *3/36, 19/02;* G01L *3/00;* B23B *39/00*

U.S. Cl. 82—34 R **20 Claims**



1. A work holding device in combination with a tool to act on a workpiece and comprising a chuck for gripping said workpiece, said chuck having at least one gripping face for engaging said workpiece, detection means for determining the

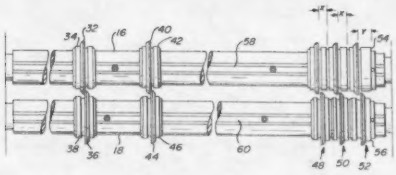
value of a desired force between said gripping face and said workpiece, said detection means comprising a sensing device positioned in the region of said gripping face to sense directly forces applied to said gripping face by said workpiece and control means to control said tool depending upon the value of said desired force detected by said detection means.

4,254,677

SLITTER BLADE POSITIONING MEANS

Donald J. Evans, Cherry Hill, N.J., assignor to Molins Machine Company, Inc., Cherry Hill, N.J.

Filed Nov. 5, 1979, Ser. No. 91,644
Int. Cl.³ B23D *19/06*
U.S. Cl. 83—13 **5 Claims**



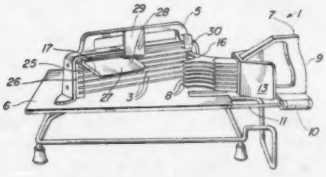
5. A method of separating the cutting edges of pairs of idle disk-shaped slitter blades mounted on heads supported by a pair of parallel shafts in a web slitting machine having a zone for parking idle heads while other pairs of heads have blades slitting a moving web into narrower webs in an operative zone, head pairs being movable in an axial direction by a master head shifter comprising the steps of providing all heads with a uniform distance between a side face of a blade and a pushing surface on the associated head except for the outermost head on one of said shafts, traversing the master shifter to a position outward of the idle head pairs, moving the idle head pairs by said master shifter in an axial direction toward the operative pairs of heads until the pushing surface on said one head is aligned with the pushing surface on its mating head to thereby separate the mating blades on the idle head pairs.

4,254,678

SAFETY GUARD FOR FOOD SLICER

Robert A. Steiner, Lincolnwood, and Robert A. Novy, LaGrange Park, both of Ill., assignors to Prince Castle, Inc., Carol Stream, Ill.

Filed Jan. 23, 1980, Ser. No. 114,944
Int. Cl.³ B26D *4/20*
U.S. Cl. 83—425.3 **8 Claims**



1. In a manual food slicer embodying a supporting base, a cutter unit mounted on said base, said cutter unit including a stack of elongated, substantially horizontally extending, parallel, spaced cutter blades, and a pusher unit slidably mounted on said base for movement, at an acute angle to the length of said cutter blades, toward and away from said cutter unit into food-slicing and food-receiving positions, respectively, said pusher unit embodying a plurality of pusher blades movable along said cutter blades from one end portion to the other end portion of the latter into intermeshed relation to said cutter blades when said pusher unit is moved into said food-slicing position from said food-receiving position, said pusher blades being disposed in outwardly spaced relation to said cutter blades in position for receiving food to be sliced between said cutter blades and said pusher blades when said pusher unit is disposed in said food-receiving position, and a handle for manually moving said pusher unit between said food-slicing and said food-receiving positions, the combination of

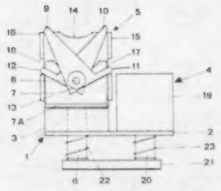
a. supporting means mounted on said cutter unit, and
b. an elongated guard rotatably mounted at its upper edge portion on said supporting means for rotation between a raised position and a lowered position,
c. said guard comprising
  (1) a plate disposed at one end thereof,
  (2) another handle disposed above said plate for manually moving said guard from said lowered position to said raised position thereof, and
  (3) an elongated finger disposed at the other end thereof,
d. said plate
  (1) being disposed
    (a) between said cutter blades and said pusher blades in covering relation to said other end portion of said cutter blades when said guard is disposed in said lowered position, and
    (b) above said pusher blades when said guard is disposed in said raised position, and
  (2) having a lip
    (a) on the edge thereof which faces toward said finger, and
    (b) projecting toward said pusher blades when said guard is disposed in said lowered position,
e. said other handle
  (1) projecting substantially horizontally from said plate and cutter blades when said guard is disposed in said lowered position, and
  (2) projecting upwardly from and above said plate and said cutter blades when said guard is disposed in said raised position, and
f. said finger projecting from said supporting means in position to abuttingly engage said pusher unit in position to prevent said pusher blades from engaging said lip when said pusher unit is moved from said food-receiving position toward said food-slicing position with said guard disposed in said lowered position.

4,254,679

AUTOMATIC YARN CUTTING MECHANISM

Horst Mathey, Jona, Switzerland, assignor to Gebrüder Loepfe AG, Zürich, Switzerland

Filed Nov. 9, 1977, Ser. No. 849,947
Int. Cl.² B23D *17/02*
U.S. Cl. 83—575 **2 Claims**



1. An automatic yarn cutting mechanism, comprising a scissor device, an electromagnet provided with a plunger piston, and spring means holding the scissor device and plunger piston in their inoperative positions when the electromagnet is deenergized;

the scissor device comprising a movable post fixedly connected to said plunger piston in parallel relationship thereto, a pin connected to said post in transverse relationship thereto, two scissor blades pivotably mounted on said

pin, each scissor blade having a trip arm extending radially outward from said pin; and

a guide structure arranged in fixed and side-by-side relationship to said electromagnet, said guide structure having two recesses receiving the free ends of said trip arms and limiting their upward and downward movement in a direction parallel to said post and plunger piston.

4,254,680

CUTTER BLOCK FOR ATTACHMENT TO A SHAFT

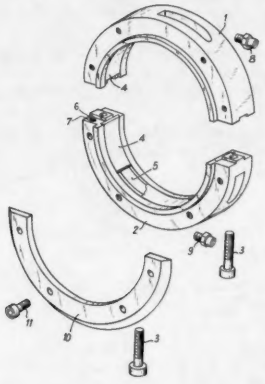
Jean Gauthier, Soissons, France, assignor to La Rochette-Cenpa, Paris, France

Filed Oct. 15, 1979, Ser. No. 84,753

Claims priority, application France, Oct. 13, 1978, 78 2949

Int. Cl.³ B23D *19/06, 35/00*

U.S. Cl. 83—665 **2 Claims**



1. A cutter block for attachment to a rotatable shaft, the block being in the form of a substantially rectangular sectioned torus comprising two substantially symmetrical semi-circular elements which are assembled to one another by a screw, each semi-circular element being hollow and having at a radially inner portion thereof a flexible membrane which defines a cavity in the said element, a passage being provided which connects the cavity in one element to the cavity in the other element, the tightness of the passage being ensured by an O-joint, whereby the cutter block is attachable to the rotatable shaft by causing it to surround the said shaft and pressurising the said cavities to cause distortion of the said membranes.

4,254,681

MUSICAL WAVESHAPE PROCESSING SYSTEM

Toshio Kugisawa, Hamamatsu, and Noriji Sakashita, Shizuoka, both of Japan, assignors to Kabushiki Kaisha Kawai Gakki Seisakusho, Hamamatsu, Japan

Filed Mar. 31, 1978, Ser. No. 892,328

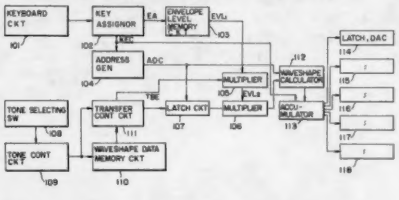
Claims priority, application Japan, Apr. 8, 1977, 52-40115; Apr. 8, 1977, 52-40116; Apr. 8, 1977, 52-40117

Int. Cl.³ G10F *1/00;* **G06F** *1/02*

U.S. Cl. 84—1.01 **4 Claims**

1. An electronic musical instrument, comprising calculating means for producing a note by repeatedly calculating the musical waveshape amplitude value of each of channels for producing notes selected on keyboards, using time-division time slots corresponding to the purality of channels, said calculating means comprising a musical waveshape calculator for calculating the musical waveshape amplitude value as a function f(t), wherein $f(t)=at^2+bc+C$, wherein a, b and c are waveshape data stored in a waveshape memory and t is the address information of the data in the memory, and said calculating means further comprising a circuit means for multiplying an envelope signal value synchronized with the time-division time slot of the waveshape data a, b and c.

3. An electronic musical instrument comprising means for calculating a musical waveshape, a tone control circuit which counts the number of time-division multiplex signals of a tone selection switch which are in the ON state with a counter every frame of time-division multiplexing and compares the count values of two successive frames representing respectively the old and the new frames to detect a change in the state of the tone selection switch from non-coincidence between the count values, thereby controlling the calculation of the musical waveshape from a corresponding old waveshape to a new waveshape, and wherein the tone control circuit has means for imparting complementary weighted envelopes to the old and the new wave shapes so as to facilitate smooth replacement of the waveshapes following the change in the state of the tone selection switch.



4,254,682

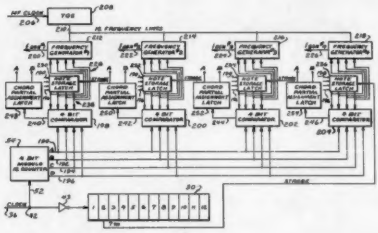
PRODUCTION OF CHORD NOTES IN A DIGITAL ORGAN

William V. Machanian, De Kalb, and William R. Hoskinson, Geneva, both of Ill., assignors to The Wurlitzer Company, De Kalb, Ill.

Filed Jun. 20, 1978, Ser. No. 917,305

Int. Cl.³ G10H *1/38, 5/00*

U.S. Cl. 84—1.01 **21 Claims**



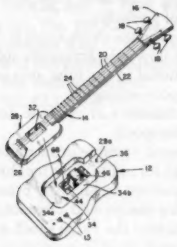
1. An electronic keyboard musical instrument comprising a keyboard having a plurality of key switches, multiplexing means interconnected with said key switches for providing serial data as to the relative positioning of at least one note played on said keyboard, memory means into which said serial data is serially transmitted, said serial data including information as to one or more chord notes played on said keyboard, means for recirculating the serial data in said memory means, circuit means for detecting the state of said serial data in said memory means, and chord structure recognizing means interconnected with said circuit means for providing an output signal when said serial data corresponds to a predetermined state corresponding to said at least one note played on said keyboard, said output signal identifying a chord structure partial identity corresponding to said at least one note played.

4,254,683

STRINGED ELECTRICAL INSTRUMENT

David Nulman, 1330 E. 27th St., Brooklyn, N.Y. 11210

Filed Dec. 8, 1978, Ser. No. 967,685
Int. Cl.[3] G10H *3/00*
U.S. Cl. 84—1.16 8 Claims



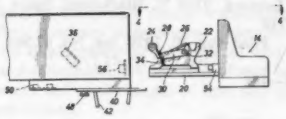
1. An electric stringed musical instrument comprising: a neck section comprising a fingerboard portion having an integrally connected head member at one end thereof and an integrally connected base portion at the other end thereof, and a plurality of strings having one of their adjacent ends mounted on said head member and extending longitudinally across the length of said fingerboard portion and the other of their adjacent ends mounted on a bridge and secured to said base portion at its end remote from said fingerboard portion, said fingerboard base portion terminating at its lower end in a tapered lip extending across the width thereof, a body section having a recessed socket adapted to receive said base portion of said neck section and a narrowed extension slot extending from said socket; electromagnetic pickup means mounted in said body section socket in operative proximity with a portion of said neck strings intermediate said fingerboard portion and said bridge when said neck section base portion is seated in said body section socket; attachment means for fixedly securing the underside of said neck section to said body section when said neck base portion is seated in said body section socket to form said electric stringed musical instrument in unitary form, said neck section base portion including a generally rectangular cut-out formed therein, said neck strings extending over said cut-out, said cut-out being sized to permit said electromagnetic pickup means to extend therethrough into operative proximity with said neck strings when said neck section base portion is seated in said body section socket, said fingerboard portion being undercut along the underside thereof to form a mount portion of fixed reduced width to be received in said extension slot when said neck section is seated in said body section, said body section socket having an undercut angled keyslot to receive said neck base portion lip in wedge-like locking engagement to secure the lower end of said neck base portion to said body section to permit rapid and secure assembly of said neck and body sections, said body section socket having a depth sized so that when said neck section base portion is seated in said body section socket, the upper surface of said neck section base portion is coplanar with the upper surface of said body section, and adjusting means located on said body section operative to adjust the position of said electromagnetic pickup means linearly vertically through said base portion cut-out in a direction perpendicular to the plane of said strings and linearly horizontally in said body section socket in the direction of the longitudinal axis of said strings.

4,254,684

BREAKDOWN PIANO

Charles T. Helpinstill, III, 5808 S. Rice Ave., Houston, Tex. 77081

Filed Jan. 25, 1979, Ser. No. 6,802
Int. Cl.[3] G10C *1/00, 3/02*
U.S. Cl. 84—176 9 Claims



1. In a piano which includes a piano body having a framework and strings therein as a first assembly, and which further includes a separable keyboard assembly which includes the keys and actuators causing hammers to strike the strings to form a musical note, the improvement which comprises:

(a) a means for aligning the keyboard assembly for removal and installation relative to the piano body;

(b) means for fixedly attaching the keyboard assembly to the piano body at an operative position such that striking a key of the keyboard assembly causes a hammer to strike an associated string in the piano body to form a musical note;

(c) lock means pivotally fixed to the keyboard assembly for securing the hammers against movement on removal of the keyboard assembly from the piano body;

(d) deflector means for engaging said pivotal lock means for releasing the hammers upon installation of the keyboard assembly in the piano body; and

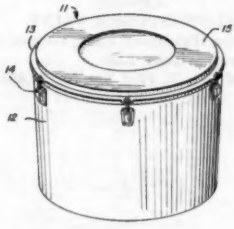
(e) wherein said attaching means selectively connects and disconnects the keyboard assembly to the piano body.

4,254,685

DRUM AND DRUMHEAD STRUCTURE

Calvin D. Rose, 68 Highview Ave., Stamford, Conn. 06907

Filed Jun. 13, 1979, Ser. No. 48,231
Int. Cl.[3] G10D *13/02*
U.S. Cl. 84—414 38 Claims



1. A drum structure comprising a generally cylindrical body section having mounted on at least one end thereof a drumhead comprising a generally circular drumhead membrane of durable flexible stretch-resistant material having a center circular portion of a predetermined average thickness comprising an area which is struck by drumsticks during normal play of the drum and an outer ring-like portion which extends appreciably over the surface of the drumhead membrane surrounding said area, said ring-like portion formed of flexible stretch resistant material together with said drumhead membrane providing an outer portion having a greater average thickness than the average thickness of said center portion and said outer portion forming with said center portion a continuous unitary drumhead membrane structure; whereby a large momentary in-

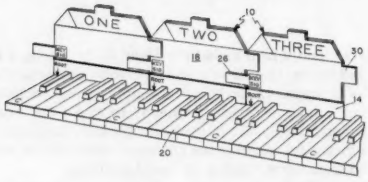
crease in the pitch of the drum is effected when said center portion of the drumhead membrane is struck a sharp blow with a drum stick and simultaneously decreasing the decay time in which the drumhead membrane returns to rest after being struck a sharp blow compared with a uniformly thick drumhead membrane of said predetermined average thickness.

4,254,686

OCTAVE SUBDIVIDED DIATONIC SCALE ORGANIZER

Verna M. Leonard, 9360 N. Blackstone, Space 278, Fresno, Calif. 93710

Filed Aug. 20, 1979, Ser. No. 67,944
Int. Cl.³ G10G *1/02*
U.S. Cl. 84—481 **5 Claims**



1. An aid to understanding the using a musical keyboard comprising:

a. a plurality of pocket-defining cards dimensioned to insert behind the keys of said keyboard and to collectively span more than one octave of said keyboard, each of said cards spanning a single octave of said keyboard;

b. each of said cards having ordered indicia displaying the scale tones of a diatonic scale of a particular key signature, said scale tones being spaced to register with corresponding keys of said keyboard when said cards are inserted therebehind;

c. a plurality of insert cards, each having a depending panel dimensioned to insert into one of the pockets defined by said pocket-defining cards; and

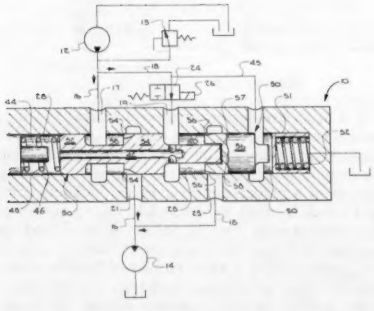
d. each of said insert cards having indicia to register with certain of said scale tones and also having a laterally extended tab to physically overlap and engage an adjacent insert card.

4,254,687

FLOW CONTROL VALVE

Frank N. Alexander, Hutchinson, Kans., assignor to The Cessna Aircraft Company, Wichita, Kans.

Filed Oct. 24, 1979, Ser. No. 87,853
Int. Cl.³ G05D *11/13*
U.S. Cl. 91—29 **7 Claims**



1. In a flow controlled hydraulic circuit having a pump source supplying a motor under changing loads, the improvement comprises a flow control valve positioned between the pump and motor including:

a valve body;

a bore in the body;

a valve spool in the bore spring-biased in one direction;

a primary flow path across the valve spool and a pilot flow path across the spool, the pilot flow path is connected in parallel with the primary path at a point upstream of the valve spool with a point downstream of the spool;

primary valving means on the valve spool in the primary path providing a variable flow area across the spool at different spool positions;

pilot valve means on the valve spool in the pilot path providing a variable flow area across the spool which is substantially proportional to the flow area of the primary means at different spool settings;

control servo chambers at opposite ends of said spool for positioning the spool;

a solenoid powered variable orifice means positioned in the pilot flow path for controlling the flow control valve; and

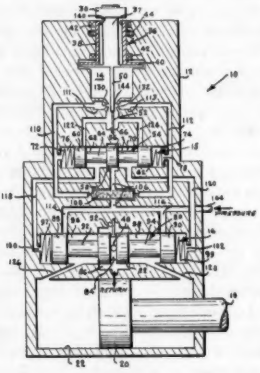
sensing passage means sensing the pressure drop across the variable orifice means and connected to the two servo chambers whereby the valve spool is positioned so that a constant pressure drop is maintained across the variable orifice regardless of motor load or rate of flow.

4,254,688

LOW FRICTION SERVO VALVE

Robert F. Richter, Rolling Hills Estates, Calif., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed May 3, 1979, Ser. No. 35,574
Int. Cl.³ F15B *13/16*
U.S. Cl. 91—365 **10 Claims**



1. A low friction servo valve comprising a housing, said housing having a centrally located main cavity, an initiator spool cavity and a boost spool cavity formed therein, means operably disposed within said main cavity for receiving an input signal and transferring said input signal to said initiator spool cavity, means operably disposed within said initiator spool cavity for receiving said input signal from said initiator spool cavity and providing a signal in accordance therewith to said boost spool cavity, means operably disposed within said boost spool cavity for receiving said signal from said means within said initiator spool cavity and providing three substantially simultaneous signals, the first of said three signals being directed to said input signal receiving means for supplementing said input signal, the second of said three signals being directed to an actuator causing the movement of said actuator and the third of said three signals being directed to said input signal receiving means for neutralizing said input signal receiving

means from transferring said input signal whereby said actuator is capable of providing an output in direct relationship to said input signal and means operably connected between said actuator and said input receiving means for returning said input receiving means to its condition prior to receiving said input signal.

4,254,689

FLUIDIC REPEATER

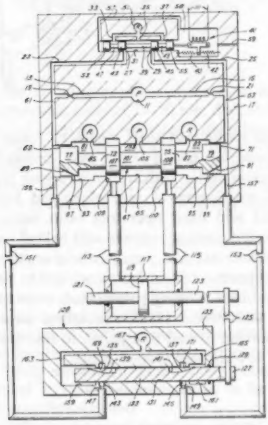
Willie B. Leonard, 5902 Royalton, Houston, Tex. 77036

Division of Ser. No. 720,410, Sep. 3, 1976, Pat. No. 4,137,825, which is a division of Ser. No. 489,829, Jul. 18, 1974, Pat. No. 3,988,966. This application Aug. 7, 1978, Ser. No. 931,322

The portion of the term of this patent subsequent to Nov. 2, 1993, has been disclaimed.

Int. Cl.³ F15B *13/16*

U.S. Cl. 91—388 **7 Claims**



1. Fluidic repeater comprising:

transmitter means, a responder, a single line for transmitting pressure signals between said transmitter means and responder, and means including a source of pressure fluid for causing a pressure fluid to flow through said line,

said transmitter means including a variable flow obstructor means connected in the afore-mentioned pressure signal transmitting line between one end thereof and said responder to create a variable pressure difference upstream and downstream of the obstructor means and thereby vary the pressure in the portion of said line between said obstructor means and said responder,

said transmitter means further including operator means connected to the flow obstructor means for changing the position of the obstructor between a first position partly blocking said fluid flow and a second position blocking said fluid flow to a lesser extent and a continuous range of intermediate positions of differing degrees of blocking said fluid flow between the blocking in said first and second positions and maintaining the obstructor in any desired one of said first, second and all intermediate positions,

said responder including a first stage and a second stage, each stage including a cylinder having a piston movable axially therein, and valve means actuated by the first stage piston controlling fluid supply from a source of pressure fluid to opposite sides of said second stage piston to cause movement of the second stage piston in response to movement of the first stage piston,

there being a space at one end of the responder first stage cylinder between said one end of the cylinder and the adjacent end of the piston therein, the aforementioned pressure signal transmitting line connecting at its other end to the responder first stage cylinder to communicate with said space between said one end of the cylinder and the adjacent end of the piston,

opposition means at the other end of the first stage piston creating an opposing force thereon independent of the position of said operating means, and

feedback means including a flow passage connecting the same said space to a reservoir of fluid at lower pressure than said line without passing through said pressure signal transmitting line, a variable flow restrictor in said flow passage, and means connecting said variable flow restrictor to one of said responder pistons to cause displacement of said flow restrictor in an amount dependent upon the amount of displacement of said one of said responder pistons and independent of the rate of said one piston's displacement and of the length of time said piston's displacement persists,

said transmitter means in a certain one of said positions of said obstructor means causing the pressure at said other end of the pressure signal transmitting line communicating with said space to produce a force to balance the force of said opposition means when said first stage piston is in a neutral position causing no movement of the second stage piston,

said transmitter means in other positions of said obstructor means causing the pressure at said other end of the pressure signal transmitting line communicating with said space to produce a force of said opposition means when said first stage piston is in said neutral position, therby to cause said first stage piston to move away from said neutral position,

said feedback means restoring the pressure in said space to that which produces a force to balance the force of said opposition means.

4,254,690

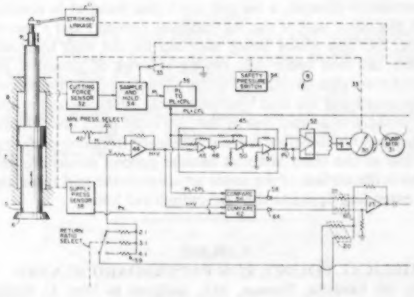
CONTROL SYSTEM FOR MACHINE TOOL WITH HYDRAULICALLY STROKED CUTTER

Erich Tlaker, and Clarence M. Nichols, both of Springfield, Vt., assignors to Fellows Corporation, Springfield, Vt.

Division of Ser. No. 758,321, Jan. 10, 1977, Pat. No. 4,136,302. This application Nov. 15, 1978, Ser. No. 960,880

Int. Cl.³ F15B *11/10*

U.S. Cl. 91—433 **9 Claims**



2. The combination in a hydro-mechanically operated machine tool of a repetitively reciprocable work spindle having for each cycle of reciprocation a work stroke and a return stroke, means for reciprocating said spindle including means defining a piston chamber to which hydraulic fluid is supplied to drive said spindle during each work stroke, a source of hydraulic fluid supplied at a supply pressure to said spindle reciprocating means, and means for controlling said supply pressure of said hydraulic fluid in response to the pressure prevailing in said piston chamber during work strokes of said spindle, said means for controlling said supply pressure of said hydraulic fluid in response to the pressure prevailing in said

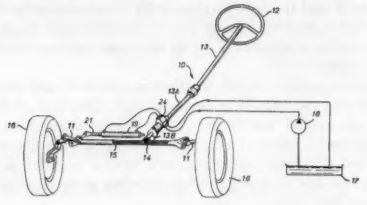
piston chamber during work strokes of said spindle including a pressure sensor connected with said piston chamber for converting the pressure of the fluid in said chamber into an analogous electrical signal, a sample and hold circuit for sampling the electrical output from said pressure sensor during only work strokes of said spindle and for producing a load pressure output signal equal to the sampled values of said pressure sensor output, and means for controlling said supply pressure of said hydraulic fluid in response to said load pressure signal.

4,254,691

ASSISTED STEERING DEVICE FOR A VEHICLE

Jean L. R. Dauvergne, Fosses, France, assignor to Societe Anonyme Francaise du Ferodo, Paris, France

Filed Feb. 22, 1979, Ser. No. 14,032
Claims priority, application France, Feb. 23, 1978, 78 05160
Int. Cl.[3] B62D *5/06*
U.S. Cl. 91—467 **22 Claims**



1. An assisted steering device for a vehicle, comprising control means acting on direction changing means, the said control means having a transmission element in two parts which are capable of limited relative angular play permitting angular offsetting of the parts under action of the control means, and assistance means which, in response to such angular offsetting are operable to act on the direction changing means in the same sense as the control means, the said assistance means comprising a hydraulic station, a hydraulic jack acting on the said direction changing means and a hydraulic distributor interposed between the station and the jack, the said distributor comprising an axial stack consisting of a first stator, a first rotor disc integral in rotation with one of the two parts of the transmission element, a second rotor disc integral in rotation with the other part of the transmission element, and a second stator, the first stator being supplied by the said hydraulic station, the first rotor disc having a series of passages, the second rotor disc having two series of passages, and the second stator supplying the said hydraulic jack, characterised in that the passages of at least one of the two rotor discs are cylindrical holes as hereinbefore defined extending from one surface of the disc to the other and that annular groove means are provided in the surface of the stator adjacent to the said rotor disc and extending opposite the said cylindrical holes.

4,254,692

HELICAL FOLDER FOR PAPERBOARD BLANKS

Louis M. Sardella, Towson, Md., assignor to Wm. C. Staley Machinery Corporation, Hunt Valley, Md.

Filed Apr. 4, 1980, Ser. No. 137,104
Int. Cl.[3] B31B *1/42*
U.S. Cl. 493—179 **8 Claims**

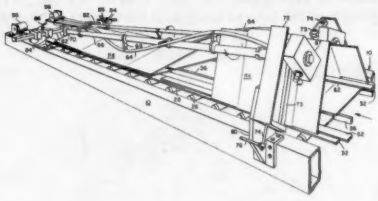
1. Apparatus for folding paperboard blanks fed one by one in timed sequence into said apparatus, each of said blanks comprising a first panel and a second panel separated by a crease, said folding comprising folding said first panel with respect to said second panel along said crease from an initial angular relationship between said panels denoted an entrance angle to a resulting angular relationship between said panels denoted an exit angle, said apparatus comprising

(a) conveyor means adapted to transport said blanks one by one in a direction of travel with said second panel being moved along a plane of travel;

(b) elongated helical folding means comprising

(i) helical blank contacting means having a longitudinal axis extending generally in the direction of travel, and

(ii) shaft means which supports said helical blank contacting means, which extends coaxially with said longitudinal axis, which is rotatable to rotate said helical blank contacting means about said longitudinal axis, and which has ends positioned to accommodate said entrance angle and provide said exit angle;



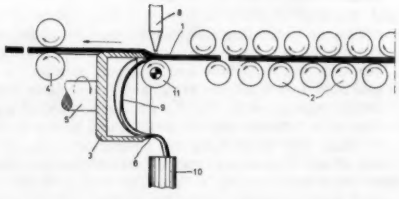
(c) means to rotate said shaft means to rotate said helical blank contacting means about said longitudinal axis in fixed operating ratio with conveyor speed; the configuration and positioning of said elongated helical folding means and said fixed operating ratio being adapted to provide initial contact between said helical blank contacting means and said first panel without impact and at only an interior portion of said first panel, and to provide thereafter, as a blank is being transported, continuous contact between said helical blank contacting means and only interior portion of said first panel, to fold said first panel smoothly toward said second panel.

4,254,693

PROCESS AND APPARATUS FOR MANUFACTURING SHEET PACKAGING MATERIAL FOR CONTAINERS

Werner Schadowski, Linnich, and Heinrich Bellut, Myhl, both of Fed. Rep. of Germany, assignors to Jagenberg Werke Aktiengesellschaft, Düsseldorf, Fed. Rep. of Germany

Filed Nov. 14, 1978, Ser. No. 960,538
Claims priority, application Fed. Rep. of Germany, Nov. 14, 1977, 2750835
Int. Cl.[3] B31B *1/14*
U.S. Cl. 493—60 **5 Claims**



2. A process for continuously finishing sheet material being continuously supplied and suited for making containers, comprising: shaving off a longitudinal strip from one face at one longitudinal edge of the sheet material so as to reduce the thickness of the sheet material along said edge; supporting the sheet material, during shaving, on said one face being shaved directly upstream of the shaving while compressed air is directed against the other opposite face of the sheet material; and removing by suction the shaved off strip.

4,254,694

COFFEE MACHINE

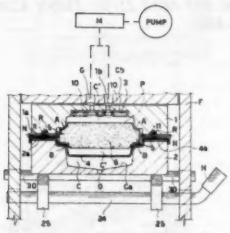
Ernesto Illy, 8, via V. Locchi, Trieste, Italy

Filed May 29, 1979, Ser. No. 42,856

Claims priority, application Italy, Jun. 8, 1978, 22072/78[U]; Jun. 8, 1978, 24322 A/78

Int. Cl.³ A47J *31/24*

U.S. Cl. 99—295 **10 Claims**



1. In a coffee brewing machine of the tupe using standardized water-permeable pods of 35–50 mm diameter and a thickness equal to 5–13 mm and containing a quantity of 5–10 grams of ground coffee having at least 45% of the coffee particles of diameter smaller than 0.4 mm and 20–55% of the coffee particles of diameter smaller than 0.1 mm which has been compressed under a pressure of at least 15 atmospheres, a combination comprising

wall means defining a brewing chamber;

a plurality of permanent filter elements of different permeability and each being individually receivable in said brewing chamber to subdivide the same into a first compartment and a second compartment having an outlet;

means for sealingly clamping circumferential edge portions of a pod located in said first compartment so that the pod is held freely suspended therein out of contact with said wall means and filter element so as to be able to swell without interference; and

means for admitting a predetermined amount of pressurized hot water per unit time into said first compartment for passage through said pod and filter element therein within a predetermined time span whereby a brewed beverage is produced whose volumetric quantity, and thus strength, is dependent upon the chosen filter element in said chamber and which contains between 22–26% of the total extractable aromatic substances in the pod.

4,254,695

COVER FOR USE ON A TOASTER

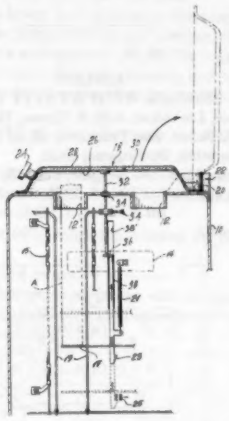
Jean-Guy Landry, 5999 Auteuil Ave., Brossard, Quebec, Canada (J4Z 1N1)

Filed May 18, 1979, Ser. No. 40,188

Int. Cl.³ A47J *37/08*

U.S. Cl. 99—334 **1 Claim**

1. In an electric toaster of the pop-up type including a toaster body having bread slice-receiving slots opening at the top thereof, internal electric heating elements, internal bread slice supports for each slot, movably mounted for up-and-down movement within the toaster body, a control arm secured to said supports and extending through the wall of said toaster body, a control handle fixed to said arm externally of said toaster body, said supports and arm movable between an upper and a lower limit position, spring means biasing said supports and arm upwardly to said upper limit position, said control handle serving to manually move said supports downwardly against the bias of said spring means to their lower limit position, catch means to retain said supports in said lowered limit position, heat-responsive means releasing said catch means to allow upward movement of said supports and arm to their upper limit position, said toaster body being combined with a cover for said toast slots, consisting of a plate slightly smaller in size than the top of said toaster body, means for hingedly mounting said plate on the top of said toaster body, so as to cover the bread slots of the toaster body, said plate being embossed in the shape of an inverted pan, so as to leave a predetermined air space between the embossed portion of the cover and the top of the toaster body, said plate being made of two metal layers between which a layer of heat-insulating material is sandwiched in the embossed portion of the plate, said means for hingedly mounting said plate including stop



means for holding the cover slightly past its equilibrium position when open, so as to prevent the cover from swinging all the way back, a handle secured to said cover along its edge remote from said means for hingedly mounting said plate, and an upstanding rod guided within said toaster body for linear vertical movement, having its lower end directly engageable with said arm and its upper end directly engageable with the underface of said plate, said rod causing partial opening of said cover when said supports and arm move upwardly to their upper limit position under the action of said spring means.

4,254,696

APPARATUS FOR FRYING INSTANT NOODLES

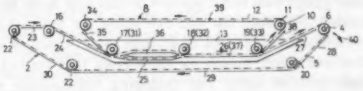
Kunihiko Ohtake, Tokyo, Japan, assignor to Ohtake Noodle Machine Mfg. Co., Ltd., Tokyo, Japan

Filed Sep. 17, 1979, Ser. No. 76,303

Claims priority, application Japan, Jul. 23, 1979, 54-92664

Int. Cl.³ A23L *1/16*; A47J *37/00*

U.S. Cl. 99—349 **3 Claims**



1. Apparatus for frying noodles comprising:

a container for heated cooking oil;

a plurality of cup-shaped receptacles;

first conveying means for moving said receptacles on a path which enters, moves through, and exits from said container;

a plurality of lids for said receptacles, each lid being cup-shaped and adapted to be telescopingly received within the upper portion of a corresponding one of said receptacles;

second conveying means for moving said lids in syncroniza-

tion with and on a path closely paralleling said first conveying means; and

guide means within said container for said first and second conveying means, said guide means having a first zone in which said lids are fully telescoped into corresponding ones of said receptacles, a following second zone in which said lids are partially raised from said corresponding ones of said receptacles and a following third zone in which said lids are fully telescoped into said corresponding ones of said receptacles.

4,254,697

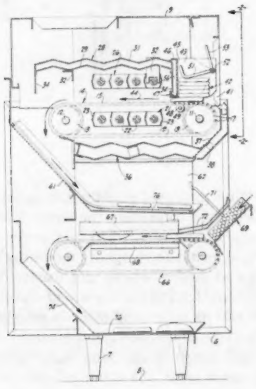
BROILER WITH A PATTY FEED

Nils Lang-Ree, Los Altos; John S. Brown, Half Moon Bay, and Edward D. Baker, San Francisco, all of Calif., assignors to NPI Corporation, Burlingame, Calif.

Continuation of Ser. No. 877,338, Feb. 13, 1978, abandoned. This application May 4, 1979, Ser. No. 36,554

Int. Cl.[3] **A47J** *37/00*

U.S. Cl. 99—387 **1 Claim**



1. A broiler with a patty-feed comprising a frame; a cover enclosure on said frame and including a top wall, side walls, a rear wall, and a front wall, said front wall having a feeding opening in the upper portion thereof, said feeding opening extending horizontally and vertically to the width and height of a stack of a plurality of hamburger patties, and said front wall having a discharging opening therein below said feeding opening; a vertical reflector wall and a vertical gauge wall extending transversely between said side walls and being substantially separated from each other to define an intermediate space, said gauge wall and a portion of said side walls defining a three-sided enclosure for and extending for more than the height of said stack of patties; an endless patty conveyor within said cover enclosure; means for supporting said conveyor on said frame with an upper run extending horizontally within said enclosure from a feed location adjacent said feeding opening, then beneath said gauge wall and said reflector wall to a discharge location spaced from said rear wall; means for advancing said upper run away from said feeding opening; a heating element on said frame above said upper run and disposed on the side of said gauge wall and said reflector wall opposite to said feeding opening; cooked patty conveyor means on said frame extending from just beneath said discharge location downwardly and forwardly toward said discharge opening; and thermal insulation occupying all of such intermediate space and lining all of one side of said three-sided patty stack enclosure.

4,254,698

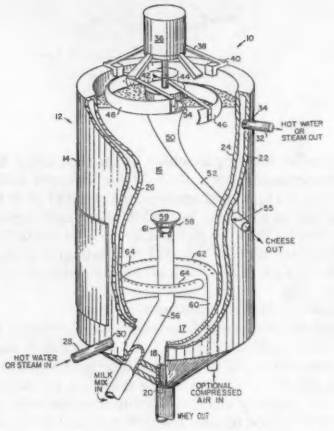
CONTINUOUS CHEESE MAKING MACHINE

Joseph Savarese, Boston, Mass., assignor to Pozzolanic Limited, Chester, England

Continuation-in-part of Ser. No. 827,875, Aug. 26, 1977, abandoned, which is a continuation-in-part of Ser. No. 679,510, Apr. 22, 1976, Pat. No. 4,044,662, which is a continuation-in-part of Ser. No. 528,207, Nov. 29, 1974, abandoned. This application May 24, 1979, Ser. No. 42,150

Int. Cl.[3] **A01J** *25/06, 25/00;* **A23C** *19/02*

U.S. Cl. 99—460 **10 Claims**



1. A machine for producing a precipitated cheese from a milk containing liquid, said machine comprising:

(a) a tank defining a chamber for receiving the milk containing liquid;

(b) inlet means mounted to said tank for introducing and radially dispresing the milk containing liquid into said tank, the radially dispersed milk containing liquid at sufficiently high acidity and temperature for forming curd and whey as the milk as the milk containing liquid is dispersed, the curd rising in said chamber;

(c) rotatable blade means horizontally disposed within said tank at an upper region thereof;

(d) drive means connected to said blade means for rotating said blade means;

(e) curd discharge means disposed within said tank at an upper region thereof below said blade means, said discharge means disposed internally and externally of the interior of said tank, said blade means operative to scoop the rising curd into said discharge means, said curd discharged from said tank through said discharge means;

(f) whey outlet means at a bottom region of said tank;

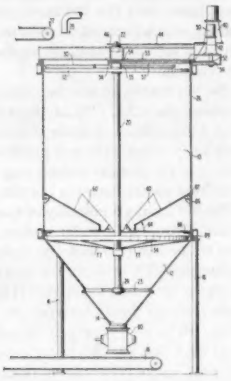
(g) sensor means for monitoring the flow rates of said curd in said discharge means and the milk containing liquid in said inlet means; and

(h) valve means connected to said inlet means and said outlet means for controlling the rate at which the milk containing liquid is introduced into said tank, said rate corresponding to the rate at which said curd is discharged through said discharge means and said whey is discharged out of said tank through said outlet means.

4,254,699
LIQUID-SOLID CONTACTING APPARATUS

Lawrence A. Skinner, and Barney W. Hilton, both of Dallas, Tex., assignors to Frito-Lay, Inc., Dallas, Tex.

Continuation of Ser. No. 764,275, Jan. 31, 1977, abandoned. This application Dec. 22, 1977, Ser. No. 863,258
Int. Cl.[3] B02B *1/04*
U.S. Cl. 99—516 43 Claims



1. Apparatus providing movement of a bed of solid particles substantially uniformly therethrough in a downwardly direction, comprising:

(a) a generally vertically-disposed vessel for containing a compact bed of solid particles in contact with a liquid;

(b) a rotatable, generally horizontally-disposed lower disc means located substantially throughout the cross-sectional area of a lower portion of said vessel for supporting said bed, said lower disc means being vertically stationary with respect to said vessel and having one or more openings for passage of solids therethrough from said bed;

(c) a rotatable, generally horizontally-disposed, upper disc means located substantially throughout the cross-sectional area of an upper portion of said vessel, said upper disc means having one or more openings for passage of solids therethrough;

(d) means for rotating said upper and lower disc means;

(e) means independent of the rotation of said upper disc means for distributing said particulate solids over the upper surface of said upper disc means during rotation of said upper disc means;

(f) said vessel being constructed above said lower disc means to permit solids therein to move uniformly by gravity downwardly in said bed substantially throughout the horizontal cross-sectional area of said bed; and

(g) means for discharging solid particles from the lower portion of said vessel while maintaining liquid in said bed above said lower disc means.

4,254,700
DOMESTIC APPLIANCE FOR THE LIQUID INJECTION OF MEAT

Edward H. Fleming, 709 Suffield St., Agawam, Mass. 01001

Filed Sep. 27, 1979, Ser. No. 79,472
Int. Cl.[3] A23L *1/31, 3/34*
U.S. Cl. 99—532 3 Claims

1. In a domestic technique for conditioning a food product by means of an injection thereinto of a conditioner, the improvement comprising a unitary handheld assemblage consisting of:

a walled housing (22) having a lowermost downwardly-depending open-ended reservoir-receiving encasement with a threaded opening through the housing wall centrally of the encasement,

a conditioner reservoir (12) having an uppermost exteriorly-threaded neck circumscribing an outlet and being receivable within the encasement for a sealed threaded interengagement with the housing wall opening,

a reciprocating pump means (16) including a pump housing (40) and a lower inlet tube (42) communicating with the pump housing via a valved opening (42) and a depressible upper slotted outlet tube/operator (44),

the pump means being held relative to the reservoir by the insertion of the pump housing and tube into the reservoir,

an inlet ball valve arrangement (48,50) for regulating communication between the pump housing and tube,

a plunger (60) within the pump housing and circumscribing the shaft,

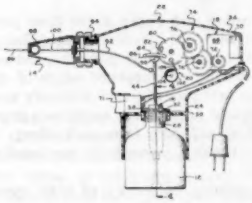
a return spring (62) disposed between the shaft and valve arrangement,

a shoulder (54) circumscribing the shaft for limiting shaft for limiting shaft upward movement and controlling plunger downward movement,

an electric motor (68) within the housing for powering the pump means,

a cam driven by the motor,

a follower in operative engagement with the operating tube and cyclically engageable and disengageable from the cam for driving the pump,



an energizing switch (71) for activating the motor,

a manifold (98) within the housing,

a conduit (92) fluidically connecting between the outlet of the pump means and manifold, and

a plurality of injection needles (96) each communicating with the manifold and projecting outwardly therefrom for insertion into the food product,

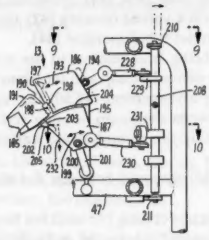
all adapted and arranged for cyclical operation whereby depression of the operator (44) under return spring compression drives the operator downwardly through plunger (60) for exposition of the operator slotting to the pump housing interior with continued downward driving of the operator effecting depression of the plunger (60) by the shoulder (54) in a volume-reducing motion for forcing a charge of the conditioner within the pump housing through the slotting and into the operator and outwardly thereof via the conduit (92) to the manifold (98) and needles (96) while effecting disengagement of the operator from the drive means on completion of the downward stroke for the upward return of the operator under urging of the return spring and with the operator shifting into a slot-sealing position while creating a vacuum in the housing for sucking the conditioner through the inlet tube 42 and lifting the valve from its seat and filling the pump housing with a next in-seriatim charge of the conditioner.

4,254,701

BLADE ARRANGEMENT IN A PEACH PITTER

David M. Anderson, Lafayette, Calif., and John C. Erb, Carson City, Nev., assignors to Filper Corporation, Reno, Nev.

Filed Sep. 11, 1978, Ser. No. 940,917
Int. Cl.[3] A23N *4/04, 4/22*
U.S. Cl. 99—554 4 Claims



1. In a cling peach pitter of the type in which the pit of a cling peach is held stationary while the peach halves are relatively twisted loose therefrom about an axis extending through such pit, including a pair of peach bisecting blades having cutting means and pit gripping means extending along their spaced, opposed edges and moveable relatively toward each other through the flesh of a peach and into gripping relation with its pit during twisting as each peach of a succession thereof is transferred along a path of travel in one direction to a pitting station between said edges, the improvement comprising:

(a) means supporting said blades in the same plane at said pitting station with said opposed edges defining the two opposed sides of an elongated space therebetween;

(b) means for moving said opposed edges of said blades transversely of said path of travel relatively toward each other to move said pit gripping means into gripping relation with said pit and away from each other;

(c) said space extending generally in continuation of said path of travel;

(d) said space opening outwardly of both opposed ends thereof,

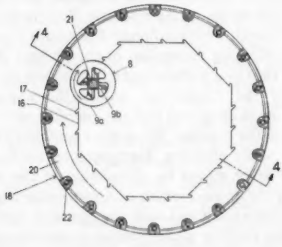
wherein a peach is transferred in said one direction into said space through one open end of said space at substantially the same time that the pitted peach and pit are discharged from the other open end thereof in the same direction.

4,254,702

DECLUSTERER DISC ASSEMBLY

Krishna R. Kumandan, Columbus, Wis., assignor to Hughes Company, Inc., Columbus, Wis.

Filed Dec. 13, 1979, Ser. No. 103,119
Int. Cl.[3] A23N *15/12*
U.S. Cl. 99—638 7 Claims



1. In a declustering apparatus for subdividing clusters of vegetable pods with stem connections, having a rotatable pod tumbling drum (**18**) with at least one axially spaced coplanar partition (**20**) having a central passage defined by an edge (**16**) and notches (**17**) spaced along the edge for engaging and elevating the stems of the pods, an improved declusterer disc assembly (**8**) for shearing the stems engaged by the partition notches (**17**) comprising:

a. a central hub (**12**) supported in rotatable relation and spaced from the edge (**16**) of the partition (**20**),

b. a pair of coplanar discs (**9***a*, **9***b*) mounted on the hub (**12**) in substantially parallel spaced relation to define a gap (**14**) therebetween of sufficient width to receive a partition (**20**) in slidable relation,

c. each disc (**9***a*, **9***b*) having an annular cutting ring (**10***a*, **10***b*) for overlapping the edge (**16**) of the rotatable partition (**20**) in close axial relation to shear stem portions engaged in the partition notches (**17**) and presented to the outer circumference of the annular cutting ring (**10***a*, **10***b*) as the rotating partition passes between the discs (**9***a*, **9***b*), and

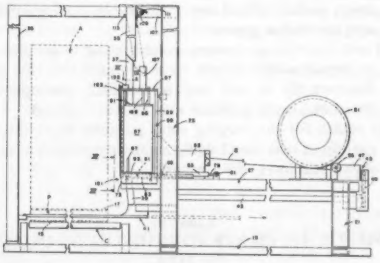
d. each disc (**9***a*, **9***b*) having a plurality of spaced spokes (**11***a*, **11***b*) extending from the annular cutting ring (**10***a*, **10***b*) and secured to the hub (**12**) to define a plurality of spaced discharge openings (**23**) between the spokes (**11***a*, **11***b*) and of greater planar area than the spokes (**11***a*, **11***b*) to permit sheared stem portions drawn between the discs (**9***a*, **9***b*) by the partition (**20**) to be discharged therefrom, the spokes (**11***a*, **11***b*) of each disc (**9***a*, **9***b*) being oriented on the hub (**12**) so that each spoke (**11***a*, **11***b*) is axially aligned with a discharge opening (**23**) of the other disc (**9***a*, **9***b*) and no substantial spoke (**11***a*, **11***b*) surfaces are in axially opposed alignment.

4,254,703

ARTICLE STRAPPING METHOD AND APPARATUS

Edward W. Fulton, Exton, Pa., and Philip J. Pistun, Newark, Del., assignors to Cyklop Strapping Corporation, Philadelphia, Pa.

Continuation-in-part of Ser. No. 47,556, Jun. 11, 1979, abandoned. This application Mar. 24, 1980, Ser. No. 132,953
Int. Cl.[3] B65B *13/22*
U.S. Cl. 100—2 31 Claims

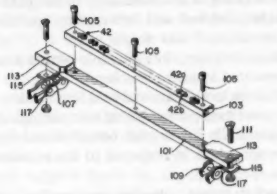


21. An article strapping method which includes the steps of lacing a strap having leading end and feed portions as a loop disposed in a plane and extending about an article which is to be strapped, engaging and moving the lead end and feed portions of the strap to impose pulling forces which approach each other on the respective strap portions to tension the strap loop about the article, and thereafter sealing overlying leading end and feed portions of the strap to maintain the strap loop in its tensioned condition about the article.

4,254,704
CONVEYOR BAR WITH POCKET INSERT FOR CAPSULE PRINTING MECHANISMS

Charles E. Ackley, Sr., Oreland, and Charles E. Ackley, Jr., Philadelphia, both of Pa., assignors to R. W. Hartnett Company, Philadelphia, Pa.

Filed Aug. 22, 1978, Ser. No. 935,772
Int. Cl.³ B41F *17/36;* B65G *47/14, 47/24*
U.S. Cl. 101—37 **6 Claims**

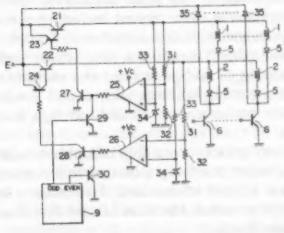


1. In a capsule transporting and printing apparatus of the type having a continuously rotatable transport cylinder having a plurality of spaced apart capsule cavities arranged to receive capsules therein, means for rotating the cylinder, printing means, and an endless conveyor disposed below the transport cylinder cavities adapted to receive capsules from said transport cylinder cavities and transport said capsules to said printing means, the combination comprising: conveyor bars carried by said conveyor, an insert member releasably attached to each said conveyor bar, said insert members having a plurality of spaced apart capsule carrying pockets therein and means for changing to different size pocket insert members, each adapted to receive a capsule from said transport cylinder, said insert member pockets each including a pair of recessed portions therein located transversely with respect to each said pocket and wherein said insert member pockets are transversely disposed with respect to the transport direction of said conveyor, said insert members being disposed generally transversely with respect to the direction of conveyor movement, the spaces between adjacent pockets on said insert member being characterized by a continuous, smooth and planar surface said printing means being adapted to print upon said capsules as they are carried in said insert member pockets.

4,254,705
PRINTING MAGNET DRIVE DEVICE

Masami Ishikawa; Hirochika Okano; Shigenobu Katagiri; Mitsugu Asano, and Toshiaki Fujieda, all of Katsuta, Japan, assignors to Hitachi Koki Company Limited, Tokyo, Japan

Continuation of Ser. No. 891,193, Mar. 29, 1978, abandoned. This application Dec. 31, 1979, Ser. No. 108,550
Claims priority, application Japan, Apr. 15, 1977, 52-43902
Int. Cl.³ B41J *9/38;* H01H *47/32;* B41J *9/14*
U.S. Cl. 101—93.29 **5 Claims**

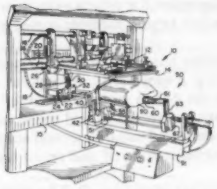


1. In a printing magnet drive device for use in a printing apparatus wherein a plurality of printing magnets adapted to energize printing hammers juxtaposed along a printing line are divided into at least two groups, the printing magnets in each of the divided groups being connected in parallel through control transistor means to a power source and a switching element is connected to each of the printing magnets for controlling the energization of the associated printing magnet, the improvement comprising: means for controlling the output terminal voltage of said control transistor means, said means for controlling comprising reference voltage producing means for producing a reference voltage, comparison means for comparing the output terminal voltage of said control transistor means with the reference voltage and feed back means for feeding back the comparison result to said control transistor means, whereby the voltage applied to the printing magnets is substantially maintained constant.

4,254,706
ACCESSORY FOR PRINTING OVAL OBJECTS

Louis A. Lala, Skokie, Ill., assignor to American Screen Printing Equipment Company, Chicago, Ill.

Filed Mar. 22, 1979, Ser. No. 22,937
Int. Cl.³ B41F *17/00, 17/28*
U.S. Cl. 101—38 R **7 Claims**



1. A printing machine for use in printing on the curved surfaces of three-dimensional objects, including a drive carriage for driving a screen in horizontal reciprocal motion at a given linear speed, a stationary squeegee for forcing ink through the screen onto the object to be printed, a tooling post and an object holding assembly mounted on said tooling post for holding and presenting the peripheral surface of said object for printing at the same linear speed as the screen, said object holding assembly comprising a nesting means for supporting said object, a drive tee securely attached to said drive carriage, said drive tee having a vertical channel means therein, a following means comprising a slide means having an end captivated in said channel means for rotational and vertical travel, a first slide mount attached to said slide means for selective vertical placement thereon, a drive block spaced from and attached to said slide mount for following parallel movement, a first bracket mounted on said tooling post, a drive shaft journalled in said first bracket in a midsection portion, said drive shaft being fixedly mounted to said drive block at a rear end and to said nesting means at the front end, and transferring the motion of said drive block to said nesting means for rocking said object to present a peripheral surface of said object for printing at a desired linear speed.

4,254,707
SCREEN PRINTING APPARATUS WITH SCREEN PEEL-OFF FROM WORK

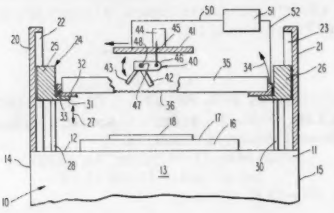
Daryl G. Lambert, Phoenix; Howard M. Sage, and Lee W. Ester, both of Glendale, all of Ariz., assignors to Itron, Inc., Phoenix, Ariz.

Filed May 2, 1979, Ser. No. 35,338
Int. Cl.³ B41F *15/46*
U.S. Cl. 101—123 **3 Claims**

1. In a screen printing apparatus including a table for carrying a blank to be printed, a screen for overlaying the blank and receiving printing fluid therein for squeezing therethrough, a

squeegee for engaging the screen, a squeegee drive means including a traversing bar for driving the squeegee across the screen in traversing movement relative thereto whereby said squeegee can urge printing fluid through said screen, means for positively separating already traversed screen portions from said blank as said squeegee traverses said screen, synchronizing means synchronizing said positive separation with said traversing motion, wherein said synchronizing means comprises:

(a) a keying member carried by said traversing bar for keying the bar to a linkage member;



(b) a linkage member for driven engagement by said keying member as said keying member is carried by said traversing bar;

(c) speed reducer means connected to said linkage member for delivering a speed-reduced angular output motion in response to the driven motion of said linkage member; and

(d) lever means connected to said speed reducer means and in raising-connected relation to said screen in accordance with the output motion of said speed reducer means.

4,254,708

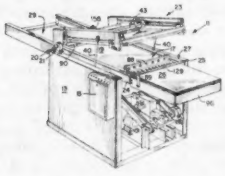
MECHANICAL DRIVE SCREEN PRINTING PRESS

Henry J. Bubley, Deerfield; John R. Krutsch, Glenview, and Claude H. Oltra, Chicago, all of Ill., assignors to American Screen Printing Equipment Company, Chicago, Ill.

Filed Jun. 23, 1978, Ser. No. 918,471

Int. Cl.[3] **B41L** *27/00*

U.S. Cl. 101—123 **19 Claims**



1. A flat-bed printing press having a frame, the improvement comprising a power source, an output shaft driven by said power source, a pivotally mounted press head, first mechanical means communicating with said output shaft to raise and lower said press head, a carriage assembly reciprocally movable as said press head raises and lowers, second mechanical drive means communicating with said output shaft to reciprocate said carriage assembly along said press head in a timed relationship to the raising and lowering of said press head, a transfer carriage having a stock infeed and takeoff means for transferring stock, a third mechanical drive means communicating with said output shaft to drive said transfer carriage for operating said stock infeed and takeoff means in a timed cycle with said press head drive means and said carriage assembly drive means, whereby stock to be printed is placed on said printing bed, printed, and then transferred from said bed in a mechanically synchronized operation wherein said second mechanical drive means for reciprocation of said carriage assembly comprises:

a first tandem sprocket rotatably mounted to said press head;

a lower sprocket rotatably mounted to a countershaft;

a first chain looped around said first tandem sprocket and said lower sprocket, the ends of said first chain attaching to a chain block;

drive arm means movable with said output shaft, and connecting at one end to said chain block for reciprocating said first chain in an essentially linear path between said lower sprocket and said first tandem sprocket in response to the rotation of said output shaft;

a second tandem sprocket movable with a head shaft rotatably mounted to said press head;

a second chain looped around said first tandem sprocket and said second tandem sprocket, said second chain movable in an essentially linear path between said first and second tandem sprockets in response to the rotation of said first tandem sprocket;

idler sprocket means rotatably mounted to said press head opposite said second tandem sprocket; and,

idler chains looped around said idler sprocket means and said second tandem sprocket, the ends of said idler chains connecting to a chain block attached to said carriage assembly whereby rotation of said second tandem sprocket reciprocates said idler chains and said carriage assembly movable therewith along said press head.

4. In a printing press including a support frame, a printing bed supporting on said frame and having an upwardly facing surface to receive stock to be printed, a press head pivotally mounted to said support frame for angular movement relative to said printing bed and said support frame, a chase pivotally mounted beneath said press head and being positioned over said stock on said printing bed, a screen removably mounted on said chase, a carriage assembly mounted to said press head for movement therealong relative to said screen and said chase, said carriage assembly having a squeegee bar and flood bar mounted thereon for movement relative to one another, a pair of head arms mounted on opposite sides of said press head for movement therewith toward and away from said printing bed, a transfer carriage adapted with carriage channels mounted to said frame beneath said printing bed for movement therealong relative to said frame, said transfer carriage having an infeed and delivery means attached thereto for simultaneous transfer of stock to and from said printing bed; the improvement comprising:

a power source;

an output shaft driven by said power source;

a first mechanical drive means operatively communicating with said output shaft for raising and lowering said press head relative to said printing bed;

a second mechanical drive means operatively communicating with said output shaft for reciprocating said carriage assembly along said press head to accomplish the print cycle in a timed relation with the raising and lowering of said press head by said press head drive means;

a third mechanical drive means including a cam means in communication with said output shaft for operation of said infeed and takeoff means in a timed cycle with the raising and lowering of said press head and reciprocation of said carriage assembly wherein said second mechanical drive means for reciprocation of said carriage assembly comprises:

a first tandem sprocket rotatably mounted to said press head;

a lower sprocket rotatably mounted to a countershaft;

a first chain looped around said first tandem sprocket and said lower sprocket, the ends of said first chain attaching to a chain block;

drive arm means movable with said output shaft, and connecting at one end to said chain block for reciprocating said first chain in an essentially linear path between said lower sprocket and said first tandem sprocket in response to the rotation of said output shaft;

a second tandem sprocket movable with a hand shaft rotatably mounted to said press head;

a second chain looped around said first tandem sprocket and said second tandem sprocket, said second chain movable in an essentially linear path between said first and second tandem sprockets in response to the rotation of said first tandem sprocket;

idler sprocket means rotatably mounted to said press head opposite said second tandem sprocket; and,

idler chains looped around said idler sprocket means and said second tandem sprocket, the ends of said idler chains connecting to a chain block attached to said carriage assembly whereby rotation of said second tandem sprocket reciprocates said idler chains and said carriage assembly movable therewith along said press head.

7. In a printing press including a support frame, a printing bed supported on said frame and having an upwardly facing surface to receive stock to be printed, a press head pivotally mounted to said support frame for angular movement relative to said printing bed and said support frame, a chase pivotally mounted beneath said press head and being positioned over said stock on said printing bed, a screen removably mounted on said chase, a carriage assembly mounted to said press head for movement therealong relative to said screen and said chase, said carriage assembly having a squeegee bar and flood bar mounted thereon for movement relative to one another, a pair of head arms mounted on opposite sides of said press head for movement therewith toward and away from said printing bed, a transfer carriage adapted with carriage channels mounted to said frame beneath said printing bed for movement therealong relative to said frame, said transfer carriage having an infeed and delivery means attached thereto for simultaneous transfer of stock to and from said printing bed; the improvement comprising:

a power source, said power source driving an output shaft;

a first mechanical drive means operatively communicating with said output shaft for raising and lowering said press head relative to said printing bed;

a second mechanical drive means operatively communicating with said output shaft for reciprocating said carriage assembly along said press head to accomplish the print cycle in a timed relation with the raising and lowering of said press head by said press head drive means;

an intermittent mechanical drive means for operation of said infeed and delivery means synchronously with the raising and lowering of said press head and reciprocation of said carriage assembly wherein said intermittent drive means comprises:

a first tandem sprocket rotatably mounted to a countershaft for movement therewith;

an idler sprocket rotatably mounted to a countershaft for movement therewith;

a first chain looped around said first tandem sprocket and said idler sprocket, the ends of said chain attaching to a chain block;

first drive arm means movable with said output shaft, and connecting at one end to said chain block for reciprocating said first chain between said first tandem sprocket and said idler sprocket in response to the rotation of said output shaft, said idler sprocket rotating alternately in one direction and then in the opposite direction with the reciprocation of said first chain;

an idler cam attached to said idler sprocket on said countershaft and movable therewith;

a fixed cam attached to said press frame adjacent said idler cam and concentric to said countershaft;

a one-way clutch means fixed to said countershaft and alternately engageable with said idler cam and said fixed cam, said clutch means and countershaft rotating in one direction as said clutch engages said idler cam, said clutch means engaging said fixed cam as said idler cam rotates in said opposite direction thereby being prevented from rotating in said opposite direction;

a drive shaft rotatably mounted to said frame at one end of said press;

a first upper sprocket mounted at one end of said drive shaft for movement therewith;

a lower sprocket rotatably mounted to said frame in alignment with said first upper drive sprocket;

a second chain looped around said first upper drive sprocket and said lower drive sprocket for movement therewith;

second drive arm means movable with said countershaft, and connecting at one end to said second chain for reciprocating said second chain in an essentially linear path between said first upper drive sprocket and said lower drive sprocket in response to the rotation of said countershaft;

a second upper sprocket fixed to said drive shaft opposite said first upper sprocket;

a third upper sprocket rotatably mounted to said frame opposite said second upper sprocket;

a third chain looped around said second upper sprocket and said third upper sprocket, the ends of said chain attaching to said transfer carriage, a third chain reciprocating in an essentially linear path between said second and third upper sprockets whereby said transfer carriage attached thereto reciprocates back and forth along said carriage channels for transfer of stock to said printing bed for printing and simultaneous removal of printed stock from said bed in a timed relationship with the raising and lowering of said press head and reciprocation of said carriage assembly.

4,254,709

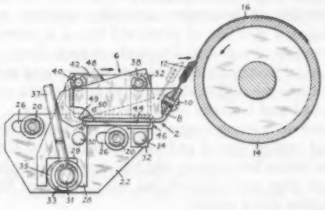
INK ROLLER CLEANING DEVICE

Karlheinz E. H. Arnolds, Stamford, Conn., assignor to Baldwin-Gegenheimer Corporation, Stamford, Conn.

Filed Jan. 23, 1976, Ser. No. 651,683

Int. Cl.[3] **B41F** *35/04*

U.S. Cl. 101—425 **9 Claims**



1. A device for cleaning an ink roller on a printing press comprising:

(a) a pan and cleaning blade assembly;

(b) a pair of mounting plates attached to the frame of the printing press;

(c) a pair of angle brackets movably attached to said mounting plates;

(d) a pair of saddle means on said angle brackets adaptable to receive one flange of said pan and cleaning blade assembly so that the pan and cleaning blade assembly can extend between the frame of the press and be positioned adjacent the ink roller;

(e) a pair of locking levers pivotally attached to said angle brackets and adapted to engage the pan and cleaning blade assembly to thereby lock the pan and cleaning blade assembly with respect to said angle brackets;

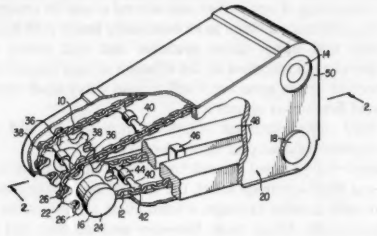
(f) means for moving said angle brackets toward and away from said ink roller so that the cleaning blade can be engaged and disengaged with said ink roller.

4,254,710

LINK-LOC CHAINLESS HAULAGE SYSTEM

Paul J. Guay, Stoughton, Mass., assignor to The United States of America as represented by the Secretary of the Interior, Washington, D.C.

Filed Nov. 7, 1978, Ser. No. 958,594
Int. Cl.³ B61B *13/00*
U.S. Cl. 104—165 **6 Claims**



1. A chainless haulage system for pulling, cutting and loading machines along a longwall mining face, comprising:

at least three pairs of sprocket wheels, each pair disposed on a separate axle with opposed wheels on each axle aligned in a pair of generally parallel planes, at least one of said pairs of wheels being drive wheels, two of said pairs of wheels disposed laterally offset, each sprocket wheel having a plurality of opposed sprockets disposed circumferentially around the periphery thereof;

a pair of endless drive chains both having adjacent chain links in generally perpendicular planes, one of said drive chains engaging sprockets of those sprocket wheels disposed in one of said parallel planes, the other chain engaging sprockets of those sprocket wheels disposed in the other of said parallel planes;

a plurality of spaced connecting crossbars disposed generally perpendicular to said pair of parallel planes to connect said endless chains to each other;

a plurality of stationary vertically oriented contact pins disposed in a line of projected travel at common spaced intervals along said longwall mining face, said line of contact pins being maintained between said endless chains and having sufficient height to contact the crossbars between said laterally offset sprocket wheels;

a common housing containing said pairs of sprocket wheels, said endless chains and said connecting crossbars;

guide means for guiding said housing and its contained parts such that said contact pins are maintained between said endless drive chains;

drive means connected to the axle of said at least one pair of drive sprocket wheels for rotating said sprocket wheels;

whereby rotation of said pair of drive sprocket wheels produces a lateral movement of said two pairs of laterally offset sprocket wheels, said crossbars moving between said laterally disposed pairs of sprocket wheels to engage said stationary contact pins and exert a force thereagainst such that said housing and its contents is propelled by force along said longwall mining face in the line of projected travel formed by the pins.

4,254,711

METALLURGICAL VESSEL HANDLING VEHICLE

Karlheinz Langlitz, Mulheim, and Günter Schmitz, Duisburg, both of Fed. Rep. of Germany, assignors to Mannesmann Demag A.G., Fed. Rep. of Germany

Filed Aug. 13, 1979, Ser. No. 66,027
Int. Cl.³ B61F *3/04, 5/00, 13/00*
U.S. Cl. 105—177 **13 Claims**

1. A transport vehicle for metallurgical vessels, comprising

(a) a carriage frame;

(b) rail engaging wheels on said carriage frame;

(c) an interior frame rotatably mounted on said carriage frame;

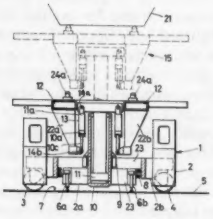
(d) ground engaging fluid pressure means on said interior frame for lifting said frame from said rails;

(e) a lift table on said vehicle for receiving metallurgical vessels therein;

(f) second fluid pressure means on said exterior frame for raising and lowering said lift table;

(g) means connecting said second fluid pressure means to said lift table, said connecting means including at least one ball-and-socket joint means connected to an articulated stabilizer support means; the improvement characterized by

(h) said second fluid pressure means positioned within a base support space defined by the diameter of a vessel to be supported;



(i) said connection means includes a plurality of spaced apart intermediate connection elements in said base support space and rigidly connected to said lift table and extending below said lift table;

(j) said stabilizer support means includes a plurality of cooperating stabilizers in said base support space and extending between said second fluid pressure means and said intermediate connection elements;

(k) the top of each stabilizer support means connected to the top of said fluid pressure means;

(l) the bottom of each stabilizer support means connected to the bottom of said cooperating intermediate connection elements; and

(m) said top and bottom connections of said stabilizer support means being said ball-and-socket means.

4,254,712

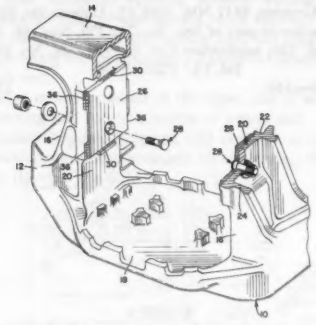
RAILWAY TRUCK SIDE FRAME WEAR PLATE MOUNTING

Gerald D. O'Neil, S. Holland, Ill., assignor to AMSTED Industries Incorporated, Chicago, Ill.

Filed Oct. 22, 1979, Ser. No. 86,932
Int. Cl.³ B61F *5/12, 5/50;* **F16D** *69/04*
U.S. Cl. 105—197 DB **1 Claim**

1. A railway freight car truck side frame including a column web extending transversely of the frame, top and bottom wear plate stop lugs projecting from said web, a wear plate seated against said web between said lugs and spaced slightly from each lug, an elongated recess in each lug between its inboard and outboard ends and facing the wear plate, corresponding elongated recesses in the web behind the plate, weld metal in both of said recesses fusing the plate to the web and lugs, fasteners and aligned holes in said plate and said web whereby said fasteners extend through said aligned holes to further attach said plate to said web, whereby in the event of the failure of said fasteners and of said weld metal, vertical movement of the plate between said lugs is limited by the top and bottom lugs, and inboard and outboard elongated wear plate stop lugs on said web, said wear plate being located between said lugs and spaced slightly from each lug, an elongated recess in each lug between its ends and facing the wear plate, corresponding mating elongated recesses in the web behind the

plate, weld metal in both of said recesses fusing the plate to the web and lugs, whereby in the event of the failure of said fasten-



ers and of said weld metal, horizontal movement of the plate between said lugs is limited by the inboard and outboard lugs.

4,254,713

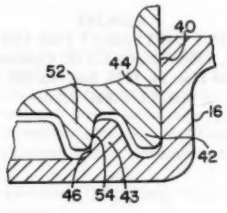
DAMPING RAILWAY TRUCK FRICTION SHOE

Arthur H. Clafford, Chicago, Ill., assignor to AMSTED Industries Incorporated, Chicago, Ill.

Filed Nov. 21, 1979, Ser. No. 96,462

Int. Cl.³ B61F *5/06, 5/12, 5/24*

U.S. Cl. 105—197 DB **1 Claim**



1. A friction apparatus for a railway car truck comprising
a side frame having a substantially upright column partially defining a bolster opening,
a bolster resiliently supported in said opening for vertical movement therein,
a vertical planar friction surface on said column, guiding surfaces on said bolster comprising sloped edge guides and separate parallel sloped raised flanges providing separate guiding surfaces,
a friction shoe comprising a substantially vertical wall, two sloped wings projecting laterally outward from said shoe forming an acute angle with said vertical wall and two separate parallel sloped flanges also projecting laterally outward from said shoe from a location downward and toward said vertical wall from said wings, each of said flanges comprising a separate raised portion of said friction shoe, said raised portion extending to a position adjacent to the vertical wall of said friction shoe,
a spring urging said wings into engagement with said edge guides and said sloped flanges into engagement with both said separate guiding surfaces thereby guiding said vertical wall into contact with said planar friction surface.

4,254,714

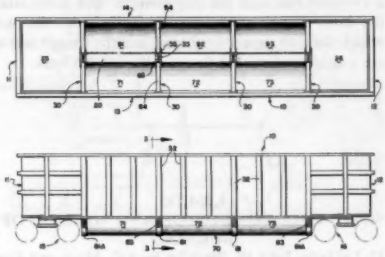
DUAL BOTTOM TROUGH GONDOLA RAILWAY CAR

James C. Heap, Munster, Ind., assignor to Thrall Car Manufacturing Company, Chicago Heights, Ill.

Filed Aug. 22, 1977, Ser. No. 826,341

Int. Cl.³ B61D *3/00, 7/00, 17/10*

U.S. Cl. 105—406 R **9 Claims**



1. A gondola railway car comprising:
a car truck attached to each end of a continuous center sill,
a pair of generally vertical end panels,
a pair of generally vertical side panels joined to the end panels,
a plurality of cross bearers extending from the center sill to a longitudinal chord at the bottom of each side panel,
a car bottom between the end and side panels having substantially flat portions over the trucks and a pair of longitudinal trough portions between the trucks and extending below the flat bottom portions,
a vertical plate joined to a cross bearer on each side of the center sill and extending downwardly terminating in a peripheral edge corresponding to the shape of the trough therebeneath,
a strip joined to each vertical plate peripheral edge and extending laterally therefrom between the longitudinal chord at the bottom of the side panel and the center sill,
the trough being in sections supported at the ends by such strips,
each trough having a side edge joined to a side panel bottom edge and a side edge joined to the center sill, and
an end wall at each end of each trough extending to the adjacent flat bottom portion.

2. A gondola railway car comprising:
a car truck attached to each end of a continuous center sill,
a pair of generally vertical end panels,
a pair of generally vertical side panels joined to the end panels,
a plurality of cross bearers extending from the center sill to a longitudinal chord at the bottom of each side panel,
the cross bearers being essentially triangular in lateral section and with the top surface thereof horizontal,
a car bottom between the end and side panels having substantially flat portions over the trucks and a pair of longitudinal trough portions between the trucks and extending below the flat bottom portions,
each trough portion having a side edge joined to a side panel bottom edge and a side edge joined to the center sill, and
an end wall at each end of each trough extending to the adjacent flat bottom portion.

4. A gondola railway car comprising:
a car truck attached to each end of a continuous center sill,
a pair of generally vertical end panels,
a pair of generally vertical side panels joined to the end panels,
a plurality of cross bearers extending from the center sill to a longitudinal chord at the bottom of each side panel,
a car bottom between the end and side panels having substantially flat portions over the trucks and a pair of longi-

tudinal trough portions between the trucks and extending below the flat bottom portions,

each trough portion having a side edge joined to a side panel bottom edge and a side edge joined to the center sill,

an end wall at each end of each trough extending to the adjacent flat bottom portion, and

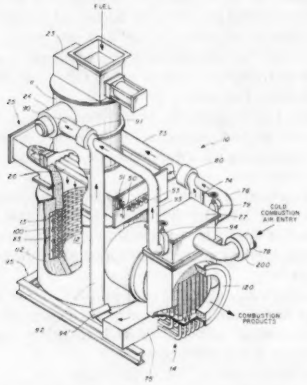
the longitudinal chord at the bottom of each side panel being a Zee-member with the Zee-member web horizontal and the inner flange extending upwardly from the web to which the side panels are joined, and the trough side edges are joined to the inner flange adjacent the web.

4,254,715

SOLID FUEL COMBUSTOR AND METHOD OF BURNING

Paul G. LaHaye; John W. Bjerklie; Ivan G. Most, and Kenneth G. Hagen, all of Cape Elizabeth, Me., assignors to Hague International, So. Portland, Me.

Filed Nov. 15, 1978, Ser. No. 960,750
Int. Cl.³ F23H *3/00*
U.S. Cl. 110—300 **6 Claims**



1. A solid fuel combustor for efficient burning of fuel, comprising,

a primary combustion chamber having means for introduction therein of primary air and a fuel entrance port for filling said chamber with solid particulate fuel,

a support grate underlying said primary combustion chamber for carrying said fuel thereon,

a secondary combustion chamber below said primary combustion chamber,

means for introducing secondary air to said combustor to cause burning in said secondary combustion chamber,

said secondary combustion chamber defining ash removal ports and screen means to screen ash from flow of gaseous combustion products,

said screen means defining plural gas passageways from said secondary combustion chamber to a manifold area to permit gas flow in directions opposed to a direction of travel of ash removed from said gas flow,

a heat exchanger coupled to said manifold for extracting heat from gaseous output of said manifold which is used to heat air for use in said combustor and

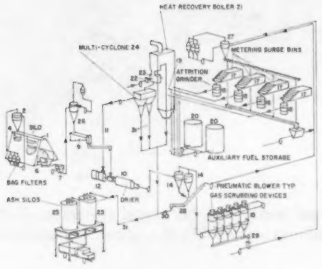
means for introducing a gas to said manifold area for maintaining said combustor at a safe outer temperature of operation.

4,254,716

METHOD AND APPARATUS FOR PREPARING ORGANIC WASTE FUELS

Donald H. Graham, 4411 NW. 15th Pl., Gainesville, Fla. 32605

Continuation-in-part of Ser. No. 742,379, Nov. 16, 1976, abandoned. This application Oct. 6, 1978, Ser. No. 949,208
Int. Cl.³ F23G *5/04*
U.S. Cl. 110—346 **17 Claims**



1. A method for preparing, classifying, and using an admixture of organic and inorganic materials as a fuel, said method comprising the steps of:

drying said admixture prior to any classification to a relatively constant, predetermined moisture content level;

classifying said admixture following said drying step to remove most of said inorganic materials therefrom; thereafter

grinding the organic constituents of said controlled moisture admixture to a reduced particle size; and thereafter

feeding said reduced particle size organic constituents into a furnace.

4,254,717

GARDENING IMPLEMENT FOR IRRIGATION

James F. Miller, 1156 Ashmount Ave., Oakland, Calif. 94610

Filed Dec. 14, 1978, Ser. No. 969,186
Int. Cl.³ A01C *23/02*
U.S. Cl. 111—7.1 **3 Claims**

1. A gardening implement comprising

an elongated hollow rod formed from a continuous piece of conduit and having a substantially straight portion and a curved portion forming a handle for the user at the upper end of the rod, said rod being tapered at its lower end to a diameter between one-third and two-thirds the diameter of its non-tapered portion, said rod having an opening for the discharge of water at said lower end,

at least one pair of flanges mounted longitudinally on said rod on opposite sides thereof along the tapered portion thereof and extending beyond the end of said rod a distance betewen one-fourth and one-half the diameter

thereof, the outer sides of said flanges being tapered inwardly and downwardly and the inner sides of said flanges being substantially straight so that said flanges abut said discharge opening without obstructing said opening, the span of said flanges being between 1 and 1.5 times the diameter of the hollow rod, the length of said flanges being between 0.5 and 1.5 times the diameter of the hollow rod,

connection means mounted on the upper end of said rod for connecting said rod to a source of water, and

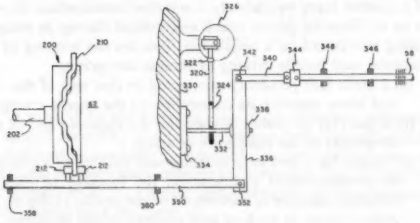
valve means disposed between said connection means and said water source and arranged for controlling the flow of water through the rod.

4,254,718

METHOD AND MEANS OF TUFTING

Abram N. Spanel, 344 Stockton St., Princeton, N.J. 08540, and David R. Jacobs, New Canaan, Conn., assignors to Abram N. Spanel, Princeton, N.J.

Filed Oct. 23, 1979, Ser. No. 95,751
Int. Cl.³ D05C *15/00*
U.S. Cl. 112—79 R **20 Claims**



1. Tufting apparatus or the like comprising:

tuft applying elements;

means to feed yarn to said tuft applying elements; and

backing layer movement means including:

(a) adjustable means for advancing said backing layer;

(b) means of adjusting lateral movement of said backing layer and

(c) means of advancing the backing layer responsive to lateral movement.

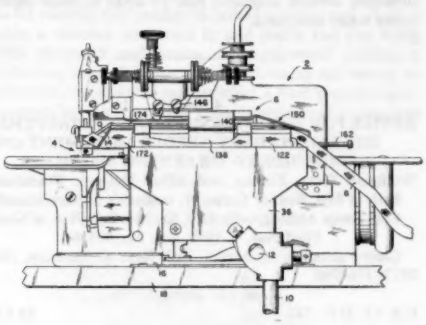
4,254,719

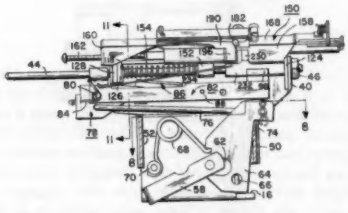
TAPE GUIDING ACCESSORY FOR SEWING MACHINES

George Zawick, Zawick Manufacturing Company, 1706 N. Main St., Hellertown, Pa. 18055

Filed May 1, 1980, Ser. No. 145,598
Int. Cl.³ D05B *37/04*
U.S. Cl. 112—130 **10 Claims**

1. In a sewing apparatus comprising in combination a stitch-forming mechanism, means for feeding material past the stitch-forming mechanism, and cutting means, located adjacent the feeding means for trimming the edge of the material being fed past the stitch-forming mechanism in a direction parallel to the direction of material movement, the improvement comprising a tape guide, and means for selectably positioning the tape guide in a first position in which the tape extends in the direction of material movement from the tape guide toward the feeding means, and in a second position in which the tape extends diagonally from the tape guide toward the feeding





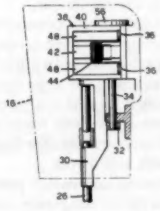
means and is drawn by the feeding means past the cutting means and cut off by the cutting means.

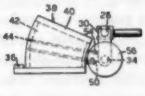
4,254,720

ELECTROMECHANICAL ACTUATOR APPLIED TO AN ELECTRONICALLY CONTROLLED SEWING MACHINE

Nereo Bianchi, Pavia, Italy, assignor to Necchi Societa per Azioni, Pavia, Italy

Filed Sep. 24, 1979, Ser. No. 78,508
Claims priority, application Italy, Oct. 5, 1978, 42914 A/78
Int. Cl.³ D05B *3/02*
U.S. Cl. 112—158 E **2 Claims**





1. Electromechanical actuator applied to an electronically controlled sewing machine, comprising a bed, a standard on said bed, an arm overhanging said bed, a head, a vertical pin fixed to said head, a needle bar gate transversely oscillatible

around said vertical pin, a ferromagnetic frame formed by four walls each one opposite to another, a magnetic pole having the shape of a part of a circle ring connecting two of said opposite walls of said frame, and a conducting wire coil being slidably arranged on said magnetic pole to make circular oscillating paths when energized.

4,254,721

DEVICE FOR THE INTERMITTENT INTERRUPTION OF THE EMBROIDERY NEEDLE MOVEMENT ON EMBROIDERY- OR SEWING MACHINES

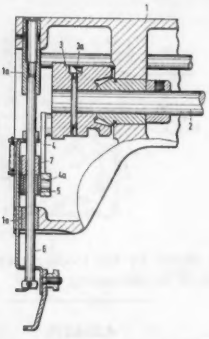
Wolfgang Teetz, Kerken, and Alfred Desprez, Wachtendonk, both of Fed. Rep. of Germany, assignors to Maschinenfabrik Carl Zangs Aktiengesellschaft, Krefeld, Fed. Rep. of Germany

Filed Nov. 7, 1978, Ser. No. 958,401

Claims priority, application Fed. Rep. of Germany, Nov. 7, 1977, 2749700

Int. Cl.³ D05B *55/16*

U.S. Cl. 112—221 **18 Claims**



1. Automatically controlled embroidery- or sewing machines, particularly multiple head automatic embroidery machines, with at least one needle bar for each head, the needle bar being operatively driven by means of a crank rod and a crank from a drive shaft, comprising

a drive carriage pivotally connected with the piston rod, said drive carriage is formed with a first catch,

a driver fastened on the needle bar,

switch pawl means operatively connected to said driver for releasably connecting said drive carriage with said driver, said driver being securable in an upper deadpoint position upon simultaneous separation from the drive carriage, said switch pawl means is formed as a pivotally mounted double arm lever, one arm of said lever is connectable with said catch of said drive carriage for said connecting of said drive carriage with said driver,

spring means for biasing said switch pawl means,

holding pawl means for the temporary interruption of movement of the needle bar by disconnecting said switch pawl means from said first catch whereby said drive carriage is released from operative connection with said driver by said holding pawl means by swinging and positively nonfrictionally securing said switch pawl means via the other arm of said switch pawl means against the force of said spring means in a position such that said one arm of said lever is non-engageable with said first catch of said drive carriage, and

switching magnet means for controlling said holding pawl means, said switching magnet means being controlled by a program of an automatic control of the embroidery- or sewing machine.

4,254,722

NEEDLE DRIVING APPARATUS FOR SEWING MACHINES

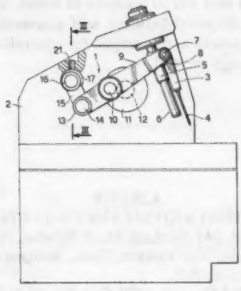
Giancarlo Minella, Milan, and Franco Marchesi, Pavia, both of Italy, assignors to Rockwell-Rimoldi, S.p.A., Milan, Italy

Filed Apr. 30, 1980, Ser. No. 145,082

Claims priority, application Italy, Jul. 18, 1979, 244445A/78

Int. Cl.³ D05B *55/14*

U.S. Cl. 112—221 **4 Claims**



1. A needle driving apparatus for a sewing machine of the type having a needle clamp reciprocatably driven by one end of a control lever operatively connected intermediate its ends to an oscillatably driven crank and guided during its reciprocating movement by a needle bar fixed on the housing of the machine, said needle driving apparatus comprising:

(a) a lever (**15**) pivotably connected to that end of the control lever opposite its connection to the needle clamp;

(b) a pin (**16**) pivotably connecting the opposite end of said lever (**15**) to the machine's housing;

(c) means for selectively locating said pin (**16**) in a plurality of predetermined positions on the housing to effect a different distance of movement of the needle clamp by the control lever in each of said predetermined positions.

4,254,723

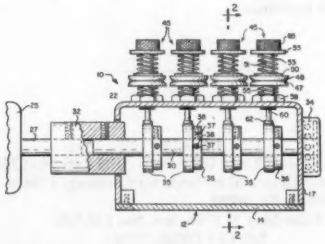
DECORATIVE STITCH FORMATION

Sheldon Rothstein, c/o N.Y. Sewing Machine, 30 W. 25th St., New York, N.Y. 10010

Filed Sep. 25, 1978, Ser. No. 945,207

Int. Cl.³ D05B *47/04*

U.S. Cl. 112—255 **6 Claims**



1. A sewing machine attachment for forming decorative stitch patterns with multiple thread sewing machines forming a seam, said attachment comprising:

a variable speed drive independent of the sewing machine;

a cam shaft coupled to said variable speed drive to be driven thereby;

a plurality of cams on said cam shaft movable therewith;

a high point on each cam;

a plurality of pairs of thread tensioning pressure plates be-

tween which the threads of the machine in connection with which the attachment is to be used are guided;
springs urging said pressure plates towards each other into thread engaging position; and
a plunger arranged to follow and be moved by said cams, said plunger coupled to said springs to effect the spring pressure exerted by said springs on said pressure plates.

4,254,724

METHOD FOR THE DETERMINATION OF THE SWITCHING MOMENTS FOR SPECIAL FUNCTIONS OF AUTOMATIC SEWING-MACHINES

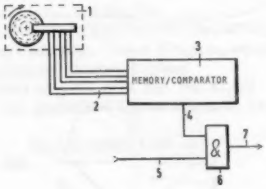
Hans Conrads, Tönisvorst, Fed. Rep. of Germany, assignor to Maschinenfabrik Carl Zangs Aktiengesellschaft, Krefeld, Fed. Rep. of Germany

Filed Jun. 13, 1979, Ser. No. 48,124

Claims priority, application Fed. Rep. of Germany, Jun. 14, 1978, 2825969

Int. Cl.³ D05B *19/00*

U.S. Cl. 112—262.1 **6 Claims**



1. A method for the determination of the switching moments for special functions of automatic embroidery, straight-stitching and sewing-machines by which the electrical signals which determine the switching moment are formed by logical switching operations in an electric and electronic control, respectively, comprising the steps of
producing electrical signals to be fed to the control by an angle coder,
driving the angle coder either directly by rotating a main drive shaft or indirectly by rotating an auxiliary shaft,
delivering bit patterns by means of the angle coder, and changing the bit patterns constantly from angle increment to angle increment of the main drive shaft,
pre-programing other bit patterns in a memory part of a memory/comparator, the latter bit patterns being representative of the different angular positions of the main drive shaft,
comparing the first-mentioned bit patterns in a logical switching operation control with the other bit patterns, and
upon bit pattern equality releasing output signals for triggering the special functions.

4,254,725

THREAD-CUTTING DEVICE FOR SEWING MACHINES HAVING A REVOLVING LOOPER

Walter Hager, Kaiserslautern, and Karl-Heinz Walther, Weilerback, both of Fed. Rep. of Germany, assignors to Pfaff Industriemaschinen GmbH, Fed. Rep. of Germany

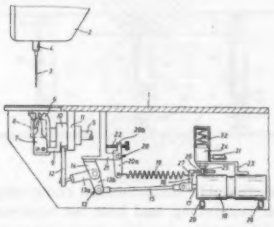
Filed Apr. 28, 1980, Ser. No. 144,015

Claims priority, application Fed. Rep. of Germany, May 3, 1979, 7912758[U]

Int. Cl.³ D05B *65/02*

U.S. Cl. 112—292 **6 Claims**

1. A thread cutting device for sewing machines including a housing mounting a reciprocating thread guide needle which cooperates with a revolving looper, comprising a thread catcher mounted in said housing adjacent the looper, a fixed knife mounted in the housing adjacent the looper, mounting means in said housing mounting said catcher for movement relative to the looper and to said knife, said catcher being engageable with the thread to move the thread into cutting engagement with said knife, a double action fluid pressure operated piston and cylinder connected to said mounting means for moving said catcher including a piston rod which is movable, a member connected to said piston rod and being movable therewith and having an engagement portion, a spring having one end connected to the housing and having an opposite end connected to said member, a fluid pressure operated control having a movable control piston rod engageable



with said engagement portion to hold it in a fixed position against the force of said spring and to release it so that said member is under the influence of said spring, said fluid pressure operated piston and cylinder piston rod during the movement of said catcher working against the force of said spring so that this movement proceeds with delay, said control piston rod, when engaged with said engagement portion holding said catcher in an inoperative postion against the force of said spring when said fluid pressure operated piston and cylinder is not actuated.

4,254,726

SEWING MACHINE CONTROL MECHANISM

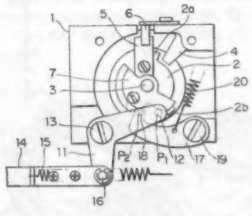
Hideaki Takenoya, Hachi-ji, Japan, assignor to Janome Sewing Machine Co. Ltd., Tokyo, Japan

Filed Feb. 13, 1980, Ser. No. 121,255

Claims priority, application Japan, Feb. 24, 1979, 54-23573[U]

Int. Cl.³ D05B *3/02, 27/22*

U.S. Cl. 112—315 **4 Claims**

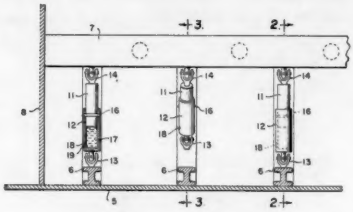


1. A sewing machine with stitch forming instrumentalities changing the relative positions of a needle and a fabric to be sewn to produce stitches in the fabric, comprising drive means (**21**) operatively connected at least one of the stitch forming instrumentalities, transmission means (**11, 24**) having one end directly connected to the drive means and the other end operatively connected to the one of the stitch forming instrumentalities, first spring means (**15, 29**) applied to the other end of the transmission means to bias the latter in the direction to the drive means, and second spring means (**20, 31**) applied to the drive means to bias the latter in the direction to the other end of the transmission means, said first and second spring means being set to provide a compound moment of zero with respect to the drive means.

4,254,727
SHOCK-CRUSH SUBFOUNDATION

Kurt G. F. Moeller, R.F.D. #3, Harness Creek Rd., Annapolis, Md. 21403

Filed Dec. 30, 1959, Ser. No. 863,053
Int. Cl.[3] B63B *3/00*
U.S. Cl. 114—65 R 13 Claims

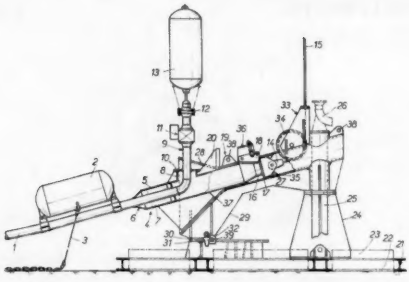


2. A shock crushable subfoundation comprising a base, a frame member reinforcing said base, an equipment support member, and deformation absorbing means interposed between said frame member and said equipment support member, said means including a universal joint connected to one of a pair of concentric cylinders jointed in overlapping relationship by a press fit, whereby said deformation absorbing means are enabled to absorb plastic deformation of said base and said frame member.

4,254,728
DEVICE FOR MOORING AND CONNECTING A SUBMARINE CONDUIT, AND METHOD EMPLOYING THE SAID DEVICE

Jean-Francois Patinet, Paris, France, assignor to Compagnie Generale pour les Developpements Operationnels des Richesses Sous-Marines "C.G. Doris", Paris, France

Filed Mar. 13, 1978, Ser. No. 886,061
Claims priority, application France, Mar. 18, 1977, 77 08190
Int. Cl.[3] B63B *21/00*
U.S. Cl. 114—230 14 Claims



1. An assembly for mooring and connecting a submarine conduit to a fixed pipeline, the submarine conduit to be connected being supported in hydrostatic equilibrium by a lightening system, the assembly comprising:

(a) a mooring head fixed to the end of the conduit to be connected,

(b) a mooring frame,

(c) a movable mooring arm displaceable in a horizontal plane on the mooring frame,

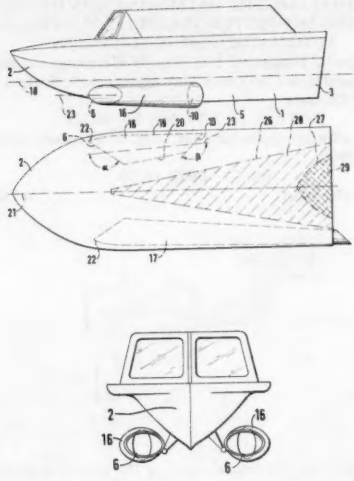
(d) means to locate an end of the pipeline on the rotational axis of the said arm, and

(e) a junction pipe to connect the end of the conduit to the end of the fixed pipeline.

4,254,729
HULLS FOR SEA VESSELS

Eckhardt Müller, Vilbeler Pfad 29, 6368 Bad Vilbel 4, Fed. Rep. of Germany

Filed Feb. 23, 1978, Ser. No. 880,334
Claims priority, application Fed. Rep. of Germany, Feb. 23, 1977, 2707631
Int. Cl.[3] B63B *1/28*
U.S. Cl. 114—280 18 Claims

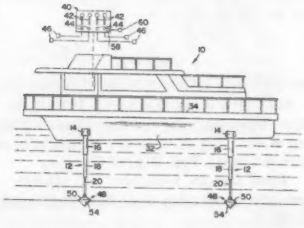


1. In a hull for a sea vessel having a bow, a stern, a design water line and a keel line, the improvement comprising a pair of flow tubes mounted to the hull and extending substantially parallel to the keel line, and symmetrically to the keel line below the design water line, each of said flow tubes having an inlet tube and an outlet tube of elliptical cross-section with the principal axis of the elliptical cross-section of the inlet tube parallel to the water line and the principal axis of the elliptical cross-section of the outlet tube vertical to the water line.

4,254,730
ANCHORING APPARATUS

William S. Crenshaw, P.O. Box 5575, Sun City Center, Fla. 33570

Filed Jul. 11, 1979, Ser. No. 56,437
Int. Cl.[3] B63B *21/24*
U.S. Cl. 114—294 4 Claims



1. An anchor apparatus to anchor houseboats or similar water craft comprising at least one retractable anchor element selectively movable between an upper or travel position and a lower or anchor position affixed to the houseboat, a swivel pad specifically configured to anchor the houseboat coupled to the lower portion of said retractable anchor element and a control device operatively coupled to said retractable anchor element

to control the vertical extension and retraction of said retractable anchor element downwardly relative to the houseboat to imbed said swivel pad in the bottom thereby anchoring the houseboat and to retract said retractable anchor element upward relative to the houseboat to permit normal travel of the houseboat when in said upper position, said retractable anchor element comprises at least an upper enlarged member and a lower reduced anchor member operatively coupled to each other, said upper enlarged anchor member coupled to an external power source to selectively move said anchor members in telescoping configuration relative to each other, said retractable anchor element further includes a spherical coupling member formed on a lower reduced portion of said lower anchor member to permit maximum lateral variation of the houseboat relative to said retractable anchor element, said swivel pad comprises an upper frustum member including a central aperture formed therein and a lower conical member to cooperatively form a hollow body to receive said spherical coupling member.

4,254,731

FILTER RESTRICTION INDICATOR

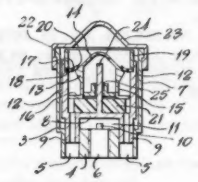
Peter F. Taylor, Cambridge, United Kingdom, assignor to Engineering Components Limited, England

Filed May 22, 1979, Ser. No. 41,456

Claims priority, application United Kingdom, May 24, 1978, 22001/78

Int. Cl.³ G01L *7/08, 19/08*

U.S. Cl. 116—268 **7 Claims**



1. An indicator device, for indicating when a pressure difference has been exceeded, comprising:

(i) a casing bounding an internal chamber and having a first port and a second port communicating with said chamber, said casing including an at least translucent portion,

(ii) a resiliently-deformable diaphragm positioned in said chamber and secured to said casing in fluid-tight manner, said diaphragm having an aperture bounded by an internal margin,

(iii) a member disposed in said casing and movable towards and through said aperture, said member including a margin-contacting portion in sealing relation to said margin whereby said diaphragm and said movable member together serve to divide said chamber into a first chamber portion communicating with said first port and a second chamber portion communicating with said second port, said margin-contacting portion being shaped to progressively pass through said aperture responsive to a progressively increasing pressure difference between said first port and said second port, said margin-contacting portion including retaining means which, upon movement through and beyond said margin as a result of exceeding of a predetermined pressure differential, cooperates with said margin to retain the movable member in a retained condition and prevent return movement thereof, said movable member in said retained condition being positioned within said at least translucent portion such that its retained condition can be observed.

4,254,732

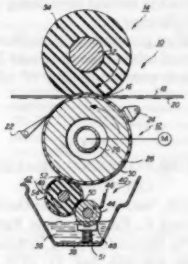
ROLL FUSER APPARATUS AND RELEASE AGENT METERING SYSTEM THEREFOR

Rabin Moser, Fairport, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Sep. 29, 1978, Ser. No. 946,939

Int. Cl.³ B05C *11/00*

U.S. Cl. 118—60 **4 Claims**



1. Roll fuser apparatus wherein a pair of rolls form a nip, through which copy substrates pass with the image side contacting a heated one of the rolls and liquid release material is applied to the surface of the heated roll by means of a release agent management system comprising a rotating roll partially immersed in the release material, contained in an open end sump and a blade contacting the portion of the roll not immersed in said release material the improvement comprising:

an air seal at least partially immersed in said release material; and

means for urging said air seal into frictional engagement with the surface of said rotating roll and maintaining such engagement, whereby an air layer is prevented from forming between said roll and at least a part of said release fluid.

4,254,733

FIXING DEVICE

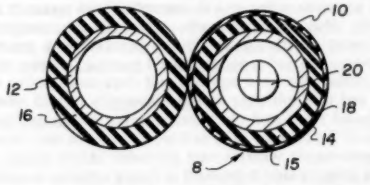
Ryoichi Namiki, Hino, Japan, assignor to Ricoh Company, Ltd., Japan

Continuation of Ser. No. 782,705, Jun. 17, 1977, abandoned. This application Mar. 19, 1979, Ser. No. 21,890

Claims priority, application Japan, Apr. 12, 1976, 51-40268

Int. Cl.³ B05C *11/00;* **G03G** *15/20*

U.S. Cl. 118—60 **4 Claims**



1. In a fixing device having a fixing roller engaged with a pressing roller for effecting fixing of toner images formed on copy sheets passed therebetween, with the fixing roller having a coating of offset preventing oil thereon, the improvement comprising:

the fixing roller including a base material layer made of a silicone rubber which is low in affinity for the oil and does not swell from contact with the oil, the roller having at its surface a thin layer of other rubber which has an affinity for said offset preventing oil, said thin layer of other

rubber being caused to swell by contact with said offset preventing oil without leaving said base material layer and without causing said base material layer to swell;

the pressing roller made of a silicone rubber material which is low in affinity for the oil and does not swell from contact with the oil;

means feeding said oil to the fixing roll;

the offset preventing oil chosen from the group consisting of fluoroalkyl radical containing polysiloxane oil and a mixture of fluoroalkyl radical containing polysiloxane oil and an alkyl polysiloxane oil;

whereby the offset preventing oil sufficiently wets said thin surface layer of other rubber of said fixing roller to form a uniform and consistent film of offset preventing oil thereon.

4,254,734

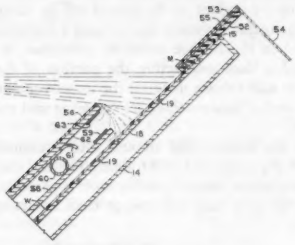
APPARATUS FOR FORMING GRADED SHADE BAND ON SUBSTRATE

Dennis S. Postupack, Natrona Heights; David A. Allerton, Glenshaw, and Richard L. Emmert, New Kensington, all of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Division of Ser. No. 898,601, Apr. 21, 1978, Pat. No. 4,208,446. This application Aug. 20, 1979, Ser. No. 68,305

Int. Cl.³ B05B *5/08*

U.S. Cl. 118—624 **5 Claims**



1. In apparatus for applying an elongated band of coating along an elongated area of a non-electroconductive substrate by electrostatic spraying to form a band having a pattern of intensity transverse of said area that comprises a first coating portion of maximum and substantially uniform intensity merging into a second coating portion of gradually diminishing intensity and then diminishing into a third coating portion of gradually diminishing minimum intensity that merges into a barely perceptible curved cut-off line along the opposite longitudinal side edge of said area, said apparatus comprising means to support said substrate in a given plane, electrostatic spray means, means to orient said electrostatic spray means to apply a highly charged electrostatic spray of dye composition toward said substrate in an oblique direction with respect to said given plane and grounded shield means of electroconductive material supported between said electroconductive spray means and said substrate in close proximity to said substrate and spaced from said electrostatic spray means at least 90 percent of the distance from said spray means to said substrate, the improvement wherein said grounded shield means comprises a primary shield disposed in facing relation to said substrate at a distance of approximately 1 to 5 millimeters from the upper surface of said substrate and a secondary shield disposed in facing relation to said primary shield at a minimum distance greater than approximately 5 millimeters from said primary shield, each of said shields having a curved lateral outboard edge conforming to the shape desired for said curved cut-off line of said elongated area, said secondary shield having a longitudinally extending curved laterally outboard edge whose shape corresponds to that of the longitudinally extending curved laterally outboard edge of said primary shield, said curved lateral outboard edge of said secondary shield being in position to intercept a portion of said spray applied by said spray means toward said substrate, said primary shield being within the shadow of said secondary shield with respect to said spray applied by said electrostatic spray means, whereby when said electrostatic spray means applies said highly charged electrostatic spray in said oblique direction, a first spray portion not intercepted by said secondary shield moves directly toward said substrate to deposit on said elongated area to form said first coating portion of substantially uniform and maximum intensity, some spray particles that pass adjacent the edge of said secondary shield en route to said substrate are attracted toward said grounded shields to deviate in their passage to said substrate to form an underspray beneath said secondary shield, part of said underspray depositing on said elongated area to help form said second coating portion of gradually diminishing intensity and some of said spray particles that pass adjacent the edge of said primary shield are attracted toward said primary shield and deviate in their path to said substrate to form an underspray beneath said primary shield, part of said underspray depositing on said elongated area to help form said third coating portion of gradually diminishing minimum intensity, the pattern of intensity transverse to said elongated area having less sharply defined boundaries between adjacent portions by virtue of the placement of said grounded shields in said relation to said substrate to affect the distribution of said electrostatic spray than shields so placed to provide mechanical barriers for spray that is not electrostatically charged.

4,254,735

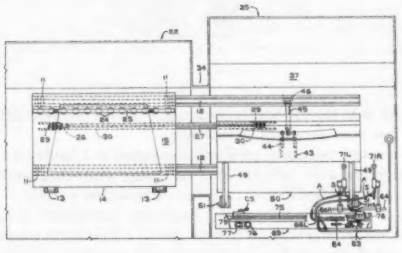
APPARATUS FOR SUPPORTING FLEXIBLE SHEET WHILE APPLYING GRADED SHADE BAND THEREON

Dennis S. Postupack, Natrona Heights, and David A. Allerton, Glenshaw, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Division of Ser. No. 898,589, Apr. 21, 1978. This application Aug. 20, 1979, Ser. No. 68,301

Int. Cl.³ B05C *13/02;* B05B *5/02, 5/08*

U.S. Cl. 118—700 **5 Claims**



1. Apparatus for applying a graded coating to a flexible sheet of interlayer material comprising a loading and unloading chamber, a coating chamber, a narrow connecting chamber, a carriage, means for moving said carriage between said loading and unloading chamber and said coating chamber, a vacuum platen pivotally mounted on said carriage and normally occupying a position of rest thereon in a substantially horizontal position, means to apply a vacuum to said vacuum platen to support said flexible sheet thereagainst, means for pivoting said vacuum platen at said coating chamber between an oblique position and a substantially horizontal position, a platen mask supported in an oblique position to be engaged by said sheet supported by said vacuum platen when the latter occupies said oblique position at said coating chamber, electrostatic spray means for applying a highly charged spray composition of finely divided dye particles in a volatile liquid vehicle through said platen mask toward an elongated area of said sheet to be coated,

means to return said vacuum platen to its position of rest in a substantially horizontal position of support on said car-

riage at said coating chamber after said spray composition is applied, and

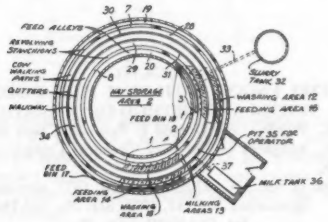
means to return said carriage to said loading and unloading chamber with said vacuum platen supported in said horizontal orientation, whereby an operator may remove said coated flexible sheet and replace the latter with another flexible sheet for coating.

4,254,736

ASSEMBLY LINE DAIRY BARN

Carl W. Bohr, R.R. #1, Ossian, Iowa 52161

Filed Nov. 13, 1978, Ser. No. 960,182
Int. Cl.[3] A01K 1/12
U.S. Cl. 119—14.03 3 Claims



1. An assembly line dairy barn, comprising

a substantially cylindrical structure having a central cylindrical hay storage area and a plurality of concentric circular paths therein around the hay storage area adjacent each other;

circular guide tracks provided in at least one of the circular paths and extending therearound;

a plurality of stanchions mounted on the guide tracks for rotation around said one of said paths for moving cows around said one of said paths to different areas of said path including washing areas wherein cows are washed, milking areas wherein cows are milked and feeding areas wherein cows are fed;

motive means coupled to the stanchions for rotating said stanchions around said one of said paths;

a feed distribution system in said structure for distributing feed to each of said stanchions, said feed distribution system including overhead circular feed bins over an innermost path adjacent the hay storage area and over an outermost path farthest from the hay storage area, a plurality of feed bunks each mounted on a corresponding one of said stanchions and moving therewith, access means in the structure for supplying feed to the overhead feed bins and transfer means for transferring feed from said overhead feed bins to the feed bunks, paths adjacent each of the outermost and innermost paths having first and second circular guide tracks provided therein and extending therearound, respectively, a first plurality of said stanchions being mounted on the first guide track for rotation therearound and a second plurality of said stanchions being mounted on the second guide track for rotation therearound, paths adjacent the first and second circular guide path tracks being first and second walking paths, respectively, for cows and having spaced washing, milking and feeding areas thereon; and

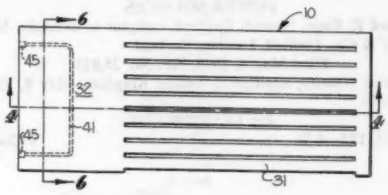
rubber matting covering said first and second walking paths for providing good footholds for cows.

4,254,737

SLOTTED FLOOR SECTION WITH BUILT-IN MEANS ADAPTED FOR HEATING WEANED PIGS IN NURSERY

William T. Herring, P.O. Box 181, Newton Grove, N.C. 28366

Filed Jun. 19, 1979, Ser. No. 50,066
Int. Cl.[3] A01K 1/02
U.S. Cl. 119—28 2 Claims



2. An integrally formed reinforced concrete slotted floor section, commonly referred to as a gang slat, adapted to be arranged in rows to serve as a floor for a nursery pen in a pig nursery and comprising

upper and lower networks of reinforcing rods embedded within said concrete gang slat,

said gang slat having a plurality of slots extending substantially greater than half the overall length of the gang slat for passage of the pigs' waste therethrough,

a solid end section devoid of slots defining an end portion of the gang slat and serving as an area on which the pigs can comfortably lie, and

means associated with said gang slat for circulation of a heated fluid therethrough and comprising

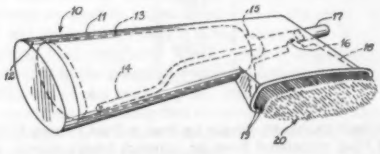
conduit means embedded within only said solid end section of the gang slat for circulation of a heated fluid therethrough so as to aid in maintaining surfaces of said end section in a warm condition conducive to the health and development of the pigs and for attracting the pigs to that end section whereby visual inspection of the pigs is facilitated; said conduit means being positioned between said upper and lower networks of reinforcing rods and including female connections defining spaced apart entrance and exit ends both accessibly positioned in the end of said solid end section to facilitate connection in a desired manner, and said female connections being entirely embedded wthin the end section so as not to project outwardly from the gang slat.

4,254,738

NO TANGLE PET BRUSH

Ada L. Stanley, 4446 S. Lindbergh Blvd., St. Louis, Mo. 63127

Continuation-in-part of Ser. No. 837,368, Sep. 28, 1977, abandoned, which is a continuation-in-part of Ser. No. 598,433, Jul. 23, 1975, abandoned. This application Aug. 27, 1979, Ser. No. 69,705
Int. Cl.[3] A01K 13/00
U.S. Cl. 119—83 10 Claims



1. A brush for grooming hair comprising a case, means defining a chamber in said case, a first web, means securing said web to said chamber, said brush having a plurality of bristles, means supporting the inner ends of the brush bristles in

the first web, each of said inner ends extending through said first web and into said chamber, means in the case for containing a treating solution, and spray means in said containing means for evenly distributing the treating solution across the first web and thereby across the inner ends of the brush bristles.

4,254,739

POWER SOURCES

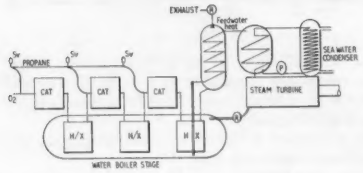
Bernard E. Enga, Nystad, England, assignor to Johnson, Matthey & Co., Limited, London, England

Filed May 4, 1979, Ser. No. 35,825

Claims priority, application United Kingdom, May 8, 1978, 18239/78

Int. Cl.³ F22B *1/00*

U.S. Cl. 122—4 D **8 Claims**



1. A power source for providing power underwater, including two or more catalytic combustors each comprising a fuel injector, a supported catalyst having a ceramic or metallic support, a high surface area refractory metal oxide coating on the support and a catalytic layer on the coating, the catalytic layer comprising a platinum group metal selected from the group consisting of Ru, Rh, Pd, Ir, Pt, alloys of the said metals with each other and alloys of one or more of the said metals with one or more base metals such that at least 10% by weight of the said catalyst is a platinum group metal, each combustor having a separate fuel supply and a separate heat exchange unit, the combustors being connected together in series such that the output from one combustor is passed through its heat exchange unit and then into the next combustor, the heat exchange units forming part of the same boiler.

4,254,740

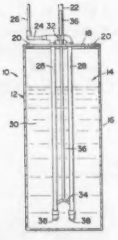
HEAT EXCHANGE DEVICE

Wallace A. Lowe, 206 34th St., W., and Donald E. Robarts, 1311 32nd St., West, both of Fla.

Filed Mar. 30, 1979, Ser. No. 25,398

Int. Cl.³ F22B *1/02*

U.S. Cl. 122—32 **1 Claim**



1. A heat exchange device to heat a fluid therein from a second fluid circulated from an external heater source, said heat exchange device includes a first and second pair of substantially vertically disposed enlarged heat exchange conduits coupled to an inlet manifold and a pair of fluid flow restrictors disposed in said inlet manifold between said first and said second pair of said substantially vertically disposed enlarged heat exchange conduits, said heat exchange device further includes an outlet manifold coupled to the lower portion of said first and second pair of enlarged substantially vertically disposed heat exchange conduit, said outlet manifold comprising a substantially vertically disposed U-shaped conduit coupled to the lower portion of said pair of enlarged heat exchange conduit said heat exchange device further includes a reduced substantially vertically disposed outlet conduit coupled to the upper portion of said substantially U-shaped conduit to feed fluid therefrom to the external heater source.

4,254,741

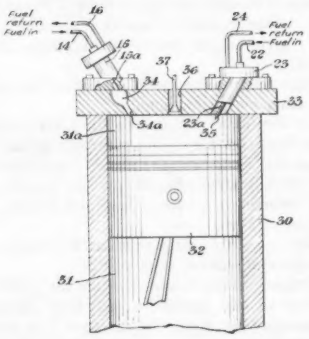
DIESEL ENGINE WITH DUAL FUEL INJECTION SYSTEM AND METHOD OF OPERATION

Craig L. Werling, and Donald I. Townsend, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 863,820, Dec. 23, 1977, abandoned. This application Nov. 13, 1978, Ser. No. 960,254

Int. Cl.³ F02B *3/08, 75/12*

U.S. Cl. 123—1 A **2 Claims**



1. A method for operating a diesel engine on a fuel mixture containing more than one fuel composition, the method comprising:

injecting a hydrocarbon diesel fuel oil into the pre-combustion chamber of a diesel engine on the compression stroke of the engine;

injecting a second liquid fuel into the combustion chamber of the engine an instant before injection of the hydrocarbon diesel fuel oil, on the compression stroke of the engine, the second liquid fuel having a higher auto ignition temperature than the diesel fuel oil, and the second liquid fuel being a member of the group consisting of halogenated aliphatic hydrocarbons, alicyclic hydrocarbons, aromatic hydrocarbons, and mixtures thereof;

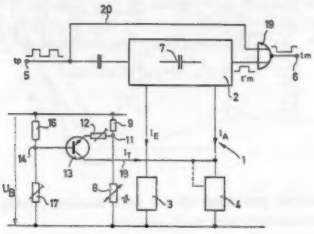
first causing the hydrocarbon diesel fuel oil to ignite and burn in the pre-combustion chamber of the engine; and

immediately thereafter causing the second liquid fuel to ignite and burn in the combustion chamber of the engine.

4,254,742
APPARATUS FOR ADAPTING ENGINE FUEL SUPPLY TO AMBIENT AIR TEMPERATURE

Hans Schnürle, Walheim; Ulrich Drews, Vaihingen-Pulverdingen; Peter Werner, Stuttgart, and Lothar Winkelmann, Ludwigsburg, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Continuation of Ser. No. 684,931, May 10, 1976, abandoned.
This application Mar. 1, 1978, Ser. No. 882,517
Claims priority, application Fed. Rep. of Germany, May 10, 1975, 2520911
Int. Cl.[2] F02B 3/00
U.S. Cl. 123—32 EA 5 Claims



1. In an apparatus for aspirated air temperature dependent fuel control for use with a fuel injection system, said system including an injection signal generator for generating fuel control pulses based on air flow rate and engine rpm, said injection system including a timing capacitor, the improvement comprising:

a first voltage divider circuit defining one of the resistance branches of a bridge circuit, and including series connected resistors connected electrically between the poles of a supply voltage, one of said series connected resistors being a temperature dependent resistor disposed in the induction tube of the engine;

a second voltage divider circuit defining the other of the resistance branches of a bridge circuit, and including series connected resistors connected electrically between the poles of the supply voltage; and

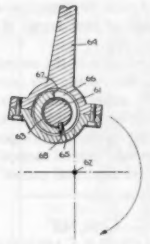
an active semiconductor element, whose first terminal electrode is connected to the junction between the resistors of the first voltage divider circuit, which junction is at a potential determined by the air temperature in the induction tube and the temperature dependent resistor, whose second terminal electrode is connected to the injection signal generator, and whose control electrode is connected to the junction between the second voltage divider circuit, whereby said fuel control pulses are changed in accordance with the current delivered by the second terminal electrode of said semiconductor element, and in dependence on air temperature of the air flow in the induction tube of the engine, said current being normally constant with a magnitude which depends solely on the air temperature, and being added to the charging current of the timing capacitor determining the length of said fuel injection pulses.

4,254,743
COMBUSTION ENGINE

Allen F. Reid, 4736 Reservoir Rd., Geneseo, N.Y. 14454, and Albert H. Halff, 3636 Lemmon Ave., Dallas, Tex. 75219

Filed Dec. 27, 1977, Ser. No. 864,394
Int. Cl.[3] F02B 75/04, 75/32
U.S. Cl. 123—48 B 2 Claims

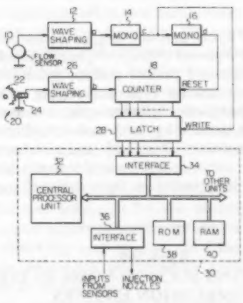
1. In an internal combustion engine the improvement comprising means for increasing the volume available to the cylinder gases for driving the engine piston at a given angle of crank rotation beyond the minimum volume position during the combustion in the first part of the power stroke with respect to the volume available to the cylinder gases at a corresponding angle of crank rotation in advance of the minimum volume position in the last part of the compression stroke, said means for increasing the volume comprising a cylindrical sleeve with an off-set center bore coupling the connecting rod to the engine crankshaft, said off-set center bore forming a thinning and then thickening sleeve cross-sectional area, said sleeve including a semi-cylindrical slot, and means postioned on said crankshaft to turn said thickest portion of said sleeve cross-sectional area of said cylindrical sleeve nearest to the cylinder head during the last part of the compression stroke while allowing a combustion force transmitted through the connecting rod to freely rotate the sleeve to position said thinnest portion of said sleeve cross-sectional area closest to the cylinder head during the first part of the power stroke.



4,254,744
METHOD AND APPARATUS FOR MEASURING AIR QUANTITY IN RELATION TO ENGINE SPEED

Masanori Mizote, Yokosuka, Japan, assignor to Nissan Motor Company, Limited, Yokohama, Japan

Filed Jun. 19, 1978, Ser. No. 916,502
Claims priority, application Japan, Jun. 30, 1977, 52-78264
Int. Cl.[3] F02D 5/00
U.S. Cl. 123—480 1 Claim



1. Apparatus for measuring the quantity of air supplied to an internal combustion engine in relation to the speed of rotation of said engine, said engine being adapted to operate under varying load conditions which result in a greater range of variations in the quantity of said supplied air than the range of variations of said engine speed, comprising:

means for generating first electrical pulses, the repetition of frequency of which is proportionally related to the rate of air supplied to said engine;

means for generating second electrical pulses, the repetition frequency of which is proportionally related to the speed of rotation of said engine and higher than the frequency of said first electrical pulses;

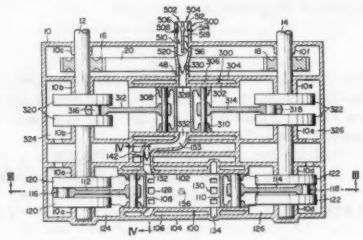
counting means for counting the number of said second electrical pulses in response to each of said first pulses;
computing means for computing the reciprocal of said counted number of said second electrical pulses to measure said quantity of air supplied to said engine in relation to said engine rotation speed;
a first monostable device for generating an output signal in response to said first electrical pulses;
a second monostable device connected to the output of said first monostable device to generate an output signal in response to an edge of the output signal from said first monostable device; and
a latching circuit responsive to the output signal of said first monostable device for storing the contents of said counting means until the subsequent occurrence of an output signal from said first monostable device;
and wherein said counting means is responsive to each of the output signals from said second monostable device to start counting said second electrical pulses.

4,254,745

TWO-STROKE CYCLE GASOLINE ENGINE

Masaaki Noguchi, Nagoya; Yukiyasu Tanaka, and Isao Igarashi, both of Okazaki, all of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Aug. 1, 1979, Ser. No. 62,808
Claims priority, application Japan, Sep. 25, 1978, 53-117588
Int. Cl.³ F02B *25/08*
U.S. Cl. 123—51 B **5 Claims**



1. A two-stroke cycle gasoline engine comprising at least one two-stroke cycle power cylinder—piston assembly having two horizontally opposed pistons and incorporating uniflow scavenging, a reciprocating type scavenging pump means including at least one pump cylinder—piston assembly of the reciprocating type driven by said power cylinder—piston assembly in synchronization therewith, and a carburetor incorporating a throttle valve and a control valve which is controlled to increase its opening as the rotational speed of the engine increases.

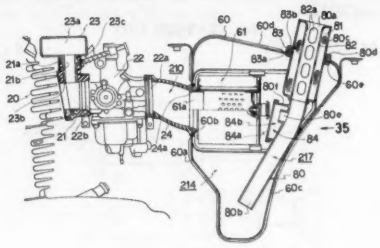
4,254,746

MEANS SILENCING SUCTION NOISE IN INTERNAL COMBUSTION ENGINES

Shoichi Chiba, Tokyo; Kunio Konuma, Shiki, and Hirofumi Ishizaki, Kami-Fukoka, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed May 30, 1978, Ser. No. 910,229
Claims priority, application Japan, May 30, 1977, 52-62934; May 31, 1977, 52-63595; May 31, 1977, 52-63596; Jun. 23, 1977, 52-74751; Jun. 23, 1977, 52-74752; Jun. 1, 1977, 52-71377[U]
Int. Cl.³ F02M *35/00;* F02B *27/00*
U.S. Cl. 123—52 M **3 Claims**

1. Apparatus for silencing suction noises of an internal combustion engine, comprising:
at least one suction passage including a suction valve of said engine, a suction path conduit, and portions of a fuel feeding device for said engine;
at least one suction pipe of substantially constant cross section having one end thereof communicating with the atmosphere;
an expansion chamber interposed between and communicating with said suction passage and said suction pipe;
said expansion chamber having a cross-sectional area larger than that of said suction passage, and a substantial volume;
the ratio of the length l of said suction pipe to the length L of said suction passage is in a range of 0.7 to 1.4;



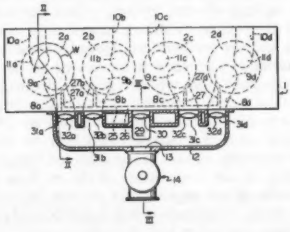
a resonator provided above said suction passage so as to communicate with said passage;
each combustion chamber of a multicylinder engine being made to communicate with said expansion chamber through an independent suction passage provided with a fuel feeding device; and
each said independent suction passage being provided with its own said resonator.

4,254,747

INTAKE SYSTEM OF A MULTI-CYLINDER INTERNAL COMBUSTION ENGINE

Masaharu Sumiyoshi; Setsuro Sekiya, and Katsuhiko Motosugi, all of Toyota, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Mar. 21, 1979, Ser. No. 22,478
Claims priority, application Japan, Apr. 18, 1978, 53/044856
Int. Cl.³ F02B *15/00*
U.S. Cl. 123—52 M **17 Claims**



1. A multi-cylinder internal combustion engine having a plurality of cylinders, each having a combustion chamber and an intake valve, said engine comprising:
at least one main intake passage common to at least two cylinders and comprising a collecting portion having an inlet, and at least two main branch intake passages branched off from said collecting portion, each of said main branch intake passages being connected to the respective combustion chamber via the corresponding intake valve;
fuel supply means arranged in the inlet of said collecting portion;
at least one auxiliary intake passage having an outlet, and an inlet which opens into said collecting portion;

at least two auxiliary branch intake passages branched off from the outlet of said auxiliary intake passage, each of said auxiliary branch intake passages having an outlet which opens into the respective main branch passage at a place near the valve gap formed between the corresponding intake valve and a valve seat thereof when the intake valve is open, the outlet being directed in the circumferential direction of the corresponding combustion chamber;

primary valve means arranged in said auxiliary intake passage and opened in accordance with increase in level of the load of an engine, and;

secondary valve means arranged in said main branch intake passages and operatively connected to said primary valve means for opening said secondary valve means after the opening degree of said primary valve means is increased beyond a predetermined opening degree.

4,254,748

IGNITION SYSTEMS FOR INTERNAL COMBUSTION SYSTEM

David H. Lewis, London, England, assignor to Lumenition Limited, London, England

Filed Nov. 13, 1978, Ser. No. 959,454

Claims priority, application United Kingdom, Apr. 6, 1978, 13545/78

Int. Cl.³ F02P *5/04*

U.S. Cl. 123—117 D **16 Claims**

1. An electronic system for controlling the ignition timing of an internal combustion engine, said system including: means for generating separate first and second voltage signals in response to revolutions of the engine, each of said signals comprising pulses which change between first and second voltage levels at a predetermined constant frequency per engine revolution with the frequency of said second signal pulses being substantially greater than the frequency of said first signal pulses; first counting means for counting the number of said second signal pulses and producing a first output signal representative thereof; means for activating said first counting means for a predetermined time period in response to said first signal changing from said first voltage level at a first predetermined crank-shaft position to said second voltage level, whereby said first counting means counts the number of said second signal pulses over said predetermined time period and said first output signal is representative of the engine speed; memory means, including a program representative of the desired advance or retard of the ignition timing as a function of engine speed in accordance with the requirements of the engine, for producing, in response to said first output signal, a second output signal representative of the number of second signal pulses required to provide the desired ignition timing; second counting means for counting said second signal pulses and initiating engine ignition after a preset number of said second signal pulses have been counted; means for adjusting said preset number in response to said second output signal in accordance with engine requirements as determined during the previous firing cycle; and means for activating said second counting means in response to said first signal changing from said second voltage level to said first voltage level at a second predetermined crank-shaft position, whereby engine ignition is initiated when said preset number of said second signal pulses have been counted by said second counting means after activation thereof.

4,254,749

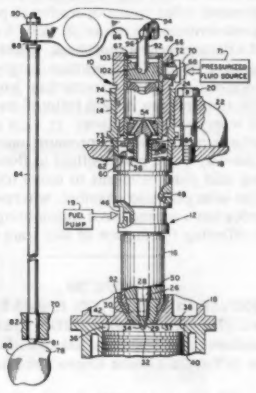
FUEL INJECTION SYSTEM AND TIMING ADVANCE DEVICE THEREFOR

John J. Krieg, and George A. Hillebrand, both of Battle Creek, Mich., assignors to Eaton Corporation, Cleveland, Ohio

Filed Mar. 23, 1979, Ser. No. 23,063

Int. Cl.³ F02M *39/00*; F02D *1/04*

U.S. Cl. 123—502 **19 Claims**



1. A system for injecting fuel into a combustion chamber of an internal combustion engine, said system comprising:

(a) drive means having a member cyclically moved in timed relationship to the events of the engine combustion cycle;

(b) injector means including means defining a fuel chamber having an injection port communicating with said combustion chamber and plunger means movable with respect to said fuel chamber for injecting a predetermined amount of fuel through said port into said combustion chamber;

(c) pump means operative upon connection to a supply of fuel to supply fuel to said fuel chamber;

(d) plunger actuating means operative in response to said drive means to move said plunger means in said fuel chamber for injecting fuel in said combustion chamber at a first predetermined time relative to the engine cycle;

(e) means operable upon selective actuation for supplying a pressurized fluid signal for altering engine operation;

(f) said drive means further including advancing means for receiving said pressurized fluid signal and operable in response thereto for varying the timing of said actuating means to a second predetermined time relative to the engine cycle, said advancing means including,

(i) housing means adapted for adjustable mounting in said engine and defining a hollow therethrough, said housing means including means defining a fluid port adapted for receiving said pressurized fluid signal from said supply means and operative to communicate said fluid signal to said hollow,

(ii) body means movably received in said hollow, said body means defining first and second spaced cavities and a first fluid passage interconnecting said cavities, and a second fluid passage operative to communicate said first cavity with said fluid port,

(iii) plunger means movably received in said first cavity and contacting said reaction means and in abutment therewith, said plunger means cooperating with the wall thereof to define an expansible fluid chamber, said plunger means and said reaction means having cooperating surfaces for defining a third fluid passage operative to communicate with said first cavity, said plunger means including one-way valve means operative to communicate said pressurized fluid signal from said third passage to said chamber for causing expansion of

said chamber and movement of said plunger means relative to said body means,

(iv) means biasing said plunger means in a direction for expanding said chamber,

(v) said body means further including means defining a reaction surface adapted for contacting an engine member in said train of members and operative, upon application of the force to said plunger means, to transmit said force to said engine members; and

(vi) pressure relief means operative to permit fluid above a predetermined pressure to flow from said chamber and exhaust to the atmosphere, wherein said plunger is operative in said first position to give said hydraulic device a first force transmitting length for effecting force transmission in said train of members and, upon said selective introduction

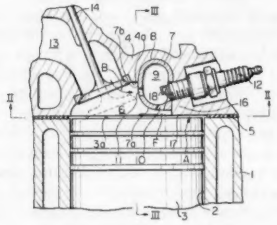
said fluid at a predetermined pressure unto said port means, said one-way valve permits fluid to flow to said chamber causing said plunger means to move toward said second position enlarging said chamber, whereupon said hydraulic device has a second force transmitting length for selectively effecting the motion of said train of members.

4,254,750

INTERNAL COMBUSTION ENGINE WITH AN AUXILIARY COMBUSTION CHAMBER

Toshio Tanahashi, and Yoshiharu Sakai, both of Toyota, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Aichi, Japan

Filed Apr. 26, 1977, Ser. No. 791,031
Claims priority, application Japan, Mar. 1, 1977, 52/20822
Int. Cl.³ F02B *23/00*
U.S. Cl. 123—269 **3 Claims**



3. An internal combustion engine comprising:

a cylinder block;

a cylinder head mounted on said cylinder block and having a cavity therein and an inner surface on which is formed a raised portion projecting downward and having a flat lower end face, said cavity having an inner wall defining an auxiliary combustion chamber;

a piston reciprocally movable in said cylinder block and having a flat top surface;

a main combustion chamber formed between the top surface of said piston and the inner wall of said cylinder head;

an intake valve movably mounted on said cylinder head for leading a lean air-fuel mixture into said main combustion chamber;

an additional intake valve movably mounted on said cylinder head for leading a rich air-fuel mixture into said auxiliary combustion chamber;

an exhaust valve movably mounted on said cylinder head for discharging an exhaust gas into the atmosphere;

squish flow producing means formed by the flat top surface of said piston and by the inner wall of said cylinder head for forming a squish area between said flat lower end face of said portion and the flat top surface of said piston which extends along the periphery of the inner surface of said cylinder head and creates a squish flow flowing towards the central portion of said main combustion chamber when said piston reaches the vicinity of the top dead center;

a passage connecting said main combustion chamber with said auxiliary combustion chamber and having a mouth which is located near said squish area and which opens into said main combustion chamber at a position such that said squish flow passes through in front of said mouth to prevent a combustible mixture stream from flowing into said auxiliary combustion chamber via said connecting passage at the time of the compression stroke so that said combustible mixture stream is decelerated; and

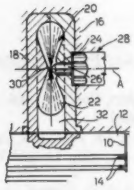
a spark plug having a spark gap located in an auxiliary chamber region consisting of said connecting passage and said auxiliary combustion chamber.

4,254,751

DIESEL ENGINES

Luigi Conti, Turin, Italy, assignor to Centro Ricerche Fiat S.p.A., Orbassano, Italy

Filed Jun. 1, 1979, Ser. No. 44,744
Claims priority, application Italy, Jul. 27, 1978, 68789 A/78
Int. Cl.³ F02B *3/00*
U.S. Cl. 123—281 **8 Claims**



1. A diesel engine comprising, in combination:

means defining at least one cylinder,

a piston axially slidable in said cylinder;

means defining a precombustion chamber located externally of said cylinder;

means defining a transfer duct which interconnects said cylinder and said precombustion chamber whereby air compressed by the sliding of said piston in said cylinder during a compression stroke can flow into said precombustion chamber, and

fuel injector means for introducing fuel under pressure into said precombustion chamber,

wherein the improvement consists in:

said precombustion chamber being substantially toroidal in shape, having its generation axis perpendicular to the axis of said cylinder, and

said fuel injector means having an outlet end part provided with a plurality of fuel atomising nozzles disposed in said precombustion chamber, said fuel injector means being coaxial with said generation axis with said nozzles being disposed substantially radially about said axis.

4,254,752

METHOD OF AND APPARATUS FOR IMPROVING OPERATION OF A DIESEL ENGINE AT LIGHT LOADS

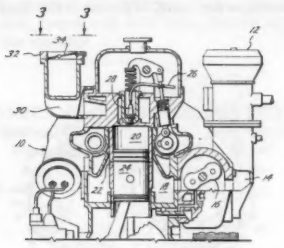
James F. Friddell, Huffman; Alves T. Ford, Deer Park, and Mike L. Ferguson, Houston, all of Tex., assignors to Stewart & Stevenson Services, Inc., Houston, Tex.

Filed Sep. 17, 1979, Ser. No. 75,852
Int. Cl.³ F02D *9/06;* **F23L** *17/02*
U.S. Cl. 123—323 **6 Claims**

1. In combination with a diesel engine having a plurality of cylinders, a piston in each cylinder, a fuel injector for each cylinder, an air blower for supplying air to the cylinders and an exhaust manifold, the improvement of means for improving engine operation at light loads comprising,

a modulating valve pivotly positioned in the exhaust manifold,

said valve is a butterfly valve which is pivotly supported off center whereby the force of the exhaust acting to open the valve acts on the differential area of the valve on opposite sides of the pivot,



a weight connected to the valve acting to bias the valve toward a closed position, said weight is connected to a lever arm connected to a pivot supporting the valve,

said valve restricting the flow from the manifold at lower loads thereby maintaining a back pressure on the exhaust at lighter loads.

4,254,753

SPEED GOVERNOR FOR FUEL INJECTED INTERNAL COMBUSTION ENGINES

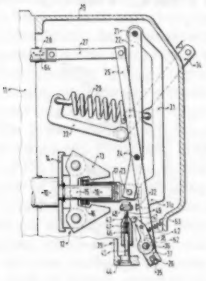
Ernst Ritter, and Reinhard Schwartz, both of Stuttgart, Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Jun. 6, 1979, Ser. No. 45,893

Claims priority, application Fed. Rep. of Germany, Jun. 10, 1978, 2825523

Int. Cl.³ F02D *1/10, 1/00*

U.S. Cl. 123—366 **17 Claims**



1. A speed governor for fuel injected internal combustion engines, comprising:

a governor sleeve displaceable as a function of engine speed;

a fuel feed rate adjusting member;

a control lever connected to the fuel feed rate adjusting member and displaceable by the governor sleeve;

a supporting pin mounted on the control lever;

a pivot axle;

a supporting lever pivotably mounted by the pivot axle, said supporting lever being in engagement with the supporting pin; and

a correction device including a servo actuator which is fuel temperature sensitive, a transmitting member which is adjustable by said servo activator, a return spring, a correction lever with one end engaging said transmitting member and actuated against the force of said return spring, said pivot axle is fixed to said supporting lever and said correction lever and rotatable by said correction lever against the force of said return spring, wherein said supporting lever is pivotably adjusted by said servo actuator during fuel temperature increases, and, through the supporting lever, the supporting pin and the control lever, the fuel feed rate adjusting member is adjusted toward an increasing feed rate in order to maintain engine power during the fuel temperature increases.

4,254,754

AIR FUEL RATIO CONTROLLER

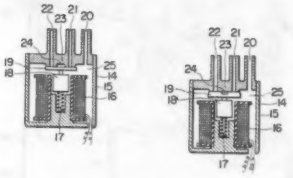
Shigetaka Takada; Masayuki Okamura, both of Ohbu; Kazumichi Naruse, Aichi, and Yukihiro Watanabe, Nagoya, all of Japan, assignors to Aisan Industry Co., Ltd., Aichi, Japan

Filed May 21, 1979, Ser. No. 41,229

Claims priority, application Japan, May 26, 1978, 53/72138

Int. Cl.³ F02B *33/00*

U.S. Cl. 123—437 **9 Claims**



1. An air-fuel ratio controller for an internal combustion engine having a carburetor with air bleeds of a slow system and a main system and air passages respectively connected with said air bleeds, comprising

an exhaust gas sensor,

a single solenoid valve having a valve member,

a control circuit means operatively connected between said sensor and said solenoid valve,

said solenoid valve having a valve seat, the air passages which are connected to said air bleeds of the slow system and of the main system define openings which open in said valve seat on a common continuous plane, said valve seat being on said common continuous plane, said valve member and said valve seat forming cooperative members mounted displaceably relative to each other,

said control circuit means for actuating, in accordance with a signal derived from said exhaust gas sensor, said valve member of said solenoid valve into contact and out of contact, respectively, with said valve seat so as to simultaneously control flow rates of bleed air in said air bleeds of said slow system and said main system,

said cooperative members each defining a cooperating surface, respectively, said cooperating surface of one of said cooperative members being formed with a recess constituting means for preventing mutual direct communication of said air passages with each other, said recess being formed in said last-mentioned surface between said openings of said air passages in said valve seat, and

chamber means for communicating said recess with an air inlet.

4,254,755

BALL THROWING MACHINE USEFUL IN PRACTICING THE GAME OF VOLLEYBALL

Steven R. Morgan, R.R. 2, Box 48H, and Dwayne E. Reese, R.R 2, Box 35L, both of Ogallala, Nebr. 69153

Filed Feb. 28, 1979, Ser. No. 16,321

Int. Cl.³ A41B *7/00*

U.S. Cl. 124—6 **15 Claims**

1. A volleyball projecting apparatus comprising

a support frame including a plurality of legs for supporting the apparatus on a floor surface and wheel means mounted

on said frame and engageable with a floor surface for supporting the frame for movement over the floor,

a machine housing having an opening in a wall thereof,

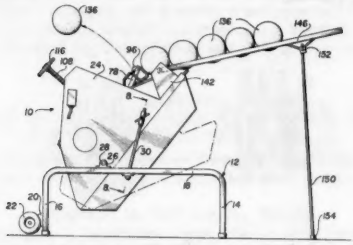
horizontal shaft means supporting said housing on said frame for pivotal movement between a first position useful in the practice of ball spiking and a second position useful in the practice of returning serves,

adjustable clamping means extending between said housing and said frame for releasably clamping said housing at said first and second positions and at any rotative position therebetween,

an elongated striking arm having ball striking means adjacent one end thereof,

means mounting said arm within said housing for pivotal movement about an axis parallel to the axis of said horizontal shaft means,

biasing means mounted within said housing and resiliently



urging said arm to a fully raised position in which said one end projects outward through said opening,

motor drive means within said housing and operable to periodically move said arm to a fully lowered position against the resistance of said biasing means and to release said arm at said lowered position to be forcefully returned to the raised position by said biasing means,

ball support means for supporting a volleyball at a striking station in position to be struck by said striking means upon movement of said arm from the fully lowered to the fully raised position, and

adjustable resilient force limiting means for selectively varying the force delivered to a ball at the striking station by said striking means

adjustable means for adjusting the position of the force limiting means,

said adjustable means being operable to variably position the limiting means relative to said arm.

4,254,756

FIREPLACE APPARATUS

William T. Wells, 3930 W. Ajo Way, Tucson, Ariz. 85725

Filed Jun. 20, 1979, Ser. No. 50,476

Int. Cl.[3] F24B *7/04, 1/18*

U.S. Cl. 126—121 **16 Claims**

1. Prefabricated fireplace apparatus insertable into a preexisting masonry fireplace in a building for heating air in a room, comprising, in combination:

a combustion chamber;

a first heated air chamber means disposed adjacent the combustion chamber for receiving a first flow of air from the room to be heated;

second air chamber means disposed adjacent the combustion chamber for receiving a second flow of air from the room to be heated;

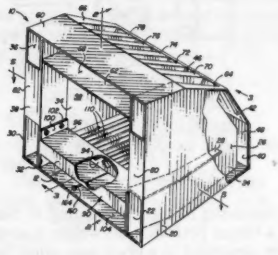
manifold means for receiving a third flow of air from the room to be heated;

third air chamber means disposed adjacent the combustion chamber for receiving the third flow of air from the room to be heated, and disposed between and communicating with the first and second air chamber means;

fourth air chamber means disposed above the combustion chamber for receiving a flow of heated air from the third air chamber;

duct means extending between the third and fourth air chambers through which the heated air flows from the third air chamber means to the fourth air chamber means;

grate means extending between the manifold means and the third air chamber means through which the third flow of air flows from the manifold means to the third air chamber means;



means for providing a flow of outside air to the combustion chamber;

air valve means for controlling the flow of outside air to the combustion chamber; and

door means for separating the first, second, and third flows of air in and from the room to be heated from the combustion air in the combustion chamber.

4,254,757

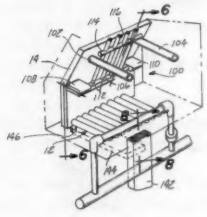
FIREPLACE HEAT GENERATING SYSTEM

Charles Emmendorfer, 11215 N. Elms Rd., Clio, Mich. 48420

Continuation-in-part of Ser. No. 837,508, Sep. 29, 1977, abandoned. This application Jul. 24, 1979, Ser. No. 60,178

Int. Cl.[3] F24B *7/00*

U.S. Cl. 126—121 **9 Claims**



1. A heat generating unit adapted to be disposed in a fireplace recess comprising:

a fireplace grate for supporting combustible material thereon, said fireplace grate comprising a plurality of adjacent, co-extensive, co-planar conduits;

an upstanding deflector shield comprising a hollow unitary member, the interior of said grate conduits being disposed in fluid communication with the interior of said deflector shield;

means for issuing heated fluid from said interior of said deflector shield into the atmosphere, said issuing means comprising:

at least one first conduit disposed above said grate conduits in fluid communication with said interior of said deflector shield;

at least one second conduit having a first end disposed intermediate between said grate conduits and said first conduit,

said first end of said second conduit being disposed in fluid communication with said interior of said deflector shield and being pivotal about said first end connected to said deflector shield such that said second conduit is adapted to rest upon and to follow the top of the pile of combustible material supported on said grate conduits downward as said combustible material is consummed; and

wherein a fluid to be heated travels from said grate conduits upwardly through said deflector shield and issues through said issuing means, said fluid being heated upon combustion of the material.

4,254,758

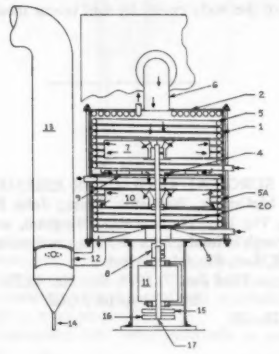
VORTEX HEAT RECLAIMING SYSTEM

George W. Banks, 24824 43rd Ave. So., Kent, Wash. 98031

Filed Aug. 17, 1979, Ser. No. 67,217

Int. Cl.³ F24B *9/00*; F04D *29/58*

U.S. Cl. 126—247 **8 Claims**



1. An improved heat reclaiming apparatus comprising in combination a housing means for defining a closed space for each of two high velocity, heat carrying gas vortexes, each of said vortexes accomplishing heat reclaiming functions at different heat and pressure levels, said housing means in the shape of an upright hollow cylinder having a top and a bottom cover and a horizontal double walled stage separating stator dividing said hollow cylinder into two spaces, the upper space being the first stage and the lower space being the second stage, said housing means having a top center gas intake channeling said gas into the eye of the first stage vortex, said gas then flows to the outer perimeter of said first stage vortex where it is forced into said stator which channels it into the eye of the second stage vortex, said gas then flows to the outer perimeter of said second stage vortex where it is forced out through the flow control orifice, the heat exchange surfaces of said stages are water carrying coils of tubing attached to and substantially covering the inside walls of said stages, a high speed impeller wheel driven by and held in the upper central position of each of said stages by the extended drive shaft of a motor, concentrically rubber mounted on the outside of said bottom cover, said second stage impeller wheel doubling the pressure of said first stage, the flow control orifice of said second stage is considerably smaller than the low pressure intake of said first stage.

4,254,759

AUTOMATIC DAMPER MEANS AND CONTROLS THEREFOR

Robert H. Schmidt, 6223 E. 56th St., Indianapolis, Ind. 46226

Filed Jan. 18, 1978, Ser. No. 870,479

Int. Cl.³ F23J *11/00*; F23L *1/00*; F23N *5/10*

U.S. Cl. 126—307 A **15 Claims**

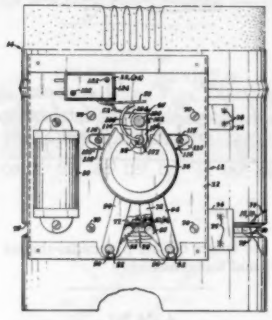
1. Damper control means for a damper means of a flue duct, which is provided with support means which support the damper means in the associated duct-work in and between a duct-open and a duct-closing position, comprising, in combination:

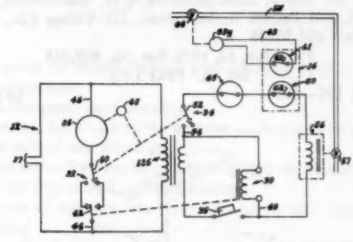
crank means operatively connected to the support means;

link means for rotating the crank means;

movable first control means for moving the link means to rotate the crank means;

drive means for moving the movable control means for rotating the crank means; and





actuation control means for actuating the said drive means, and operative in response to an associated thermostat means and to the previous movement of the drive means to actuate the drive means so as to cause and permit only movement thereof sufficient to rotate the crank means between the duct-closing and duct-open positions of the damper means.

4,254,760

CERAMIC HEAT ABSORPTION PANEL

Robert A. Sirimarco, 966 Linley Ct., Denver, Colo. 80204

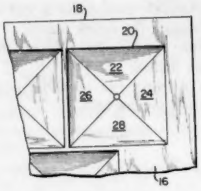
Filed Sep. 22, 1978, Ser. No. 944,764

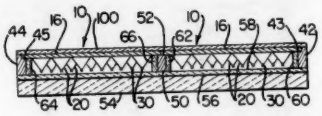
Int. Cl.³ F24J *3/02*

U.S. Cl. 126—449 **12 Claims**

1. Solar collector apparatus for collecting and converting solar radiation to heat, comprising an absorber panel having a plurality of inverted, adjacent, hollow pyramidal-shaped elements having open bases in a common plane with the base of each pyramidal-shaped formation oriented toward the source of solar radiation, and each pyramidal-shaped element having heat-absorbing sidewalls and terminating in an apex oriented away from the source of radiation, said apex including a tip end portion projecting away from said apex in a direction away from the source of solar radiation, a frame assembly having side enclosure members and a back panel attached to the bottom edges of said enclosure members, said absorber panel being position on and supported by the upper edge of said frame assembly with the apices of said pyramidal-shaped elements depending downwardly into the interior of said frame assembly, and an inlet opening and an outlet opening to ac-

comodate flow of air into, through and out of the interior of said frame assembly, said air flow being in proximity to and in





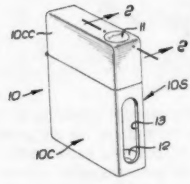
contact with the apices of said pyramidal-shaped elements in the interior of said frame assembly.

4,254,761

COMBINATION LIGHTER

Russell G. Armas, 2536 Belhaven Way, Sacramento, Calif. 95826, and Patrick A. McGowan, 221 Village Cir., Sacramento, Calif. 95838

Filed Jan. 13, 1978, Ser. No. 869,045
Int. Cl.[3] F24J *3/02*
U.S. Cl. 126—451 **10 Claims**



1. A combination of a conventional lighter and a solar lighter for lighting objects such as cigarettes, cigars and the like, comprising conventional lighter means for lighting objects such as cigarettes, cigars and the like, said conventional lighter means comprising main body means including means for producing a flame to permit an object to be lighted from the flame that is produced by conventional means within the main body by the burning of a fuel, and

solar lighting means being defined in a juxtaposed position integrally with the main body of the conventional lighter for lighting an object, said lighting means including a lens for focusing the solar rays on the object, to be lit.

4,254,762

SAFETY ENDOSCOPE SYSTEM

Inbae Yoon, 2213 Forest Ridge Rd., Timonium, Md. 21903

Filed Oct. 23, 1979, Ser. No. 87,648
Int. Cl.[3] A61B *1/00*
U.S. Cl. 128—4 **19 Claims**

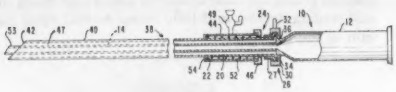
1. An endoscopic device comprising:

endoscope means including an eyepiece and an elongated body member;

sleeve means encircling at least a portion of said body member;

means for releasably attaching said sleeve means to said endoscope means adjacent the junction of said eyepiece and said body member;

needle-like trocar means having a hollow cylindrical body with a sharpened distal end for puncturing the wall of a body cavity, said trocar means encircling at least a substantial portion of said body member and said sleeve



means, said sleeve means being slidable in said trocar means; and

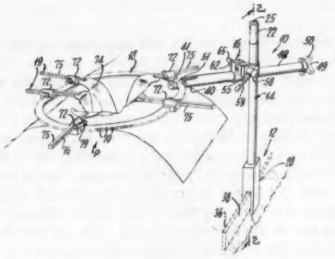
mechanical means mounted in said trocar means interacting between said trocr means and said sleeve means for providing a signal at the completion of the puncture of the wall of the body cavity by said trocar means.

4,254,763

SURGICAL RETRACTOR ASSEMBLY

James F. McCready, Wollaston, Mass.; John R. Bookwalter, Putney, Vt.; Roy W. Downing, Hingham, and George W. Guay, North Scituate, both of Mass., assignors to Codman & Shurtleff, Inc., Randolph, Mass.

Filed Jun. 7, 1979, Ser. No. 46,534
Int. Cl.[3] A61B *17/02*
U.S. Cl. 128—20 **12 Claims**



1. A surgical retractor assembly adapted for attachment to the rail of a surgical table comprising:

an elongate support post having a lower portion and an upper portion, said lower portion including adjustable clamp means for attaching the post substantially vertical to said rail;

said upper portion of said post including clamp adjustment means operatively connected to said adjustable clamp means so that the attachment and adjustment of said clamp means can be performed by the operator in an area above said rail;

extension means adjustably connected to said post for supporting a rigid ring means over a patient on said operating table and adapted to extend in a direction generally over a patient on said operating table;

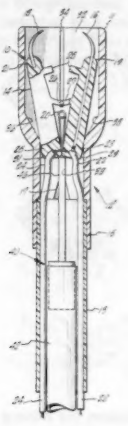
rigid ring means connected to said extension means at only one point thereof so as to cantilever said ring means over a patient for positioning a retractor blade for use on a patient; and,

at least one retractor blade mounted on said ring means.

4,254,764
CLIP ELECTRODE

Theodore C. Neward, P.O. Box 725, Cucamonga, Calif. 91730

Continuation-in-part of Ser. No. 917,556, Jun. 21, 1978, abandoned. This application Mar. 1, 1979, Ser. No. 16,427
Int. Cl.[3] A61B 5/04
U.S. Cl. 128—642 9 Claims

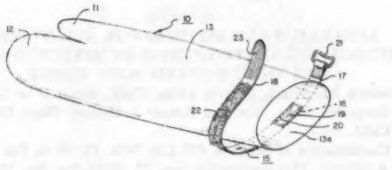


1. Apparatus for use in physiological monitoring comprising
a clip-type electrode structure having a pair of legs separated by a resilient web, each of said legs supporting a clamping member, at least one of said members being of metal to serve as an electrode,
means for connecting said metal electrode to monitoring equipment,
spring means acting upon said legs for urging said members together in a clamping fashion,
carrier means for housing said electrode structure prior to use with the clamping members separated, and
means for at least partially ejecting said electrode structure from said carrier means to allow said clamping members to be forced together and become attached to a subject when said carrier means is placed against such subject.

4,254,765
LIMB PROTECTIVE COVERINGS

Ronald E. Brown, 152 Ordale Blvd., Pittsburgh, Pa. 15228, and Jack M. Grinwis, 142 Glenfield Dr., Pittsburgh, Pa. 15235

Filed Aug. 17, 1979, Ser. No. 67,338
Int. Cl.[3] A61F 13/00
U.S. Cl. 128—82 9 Claims

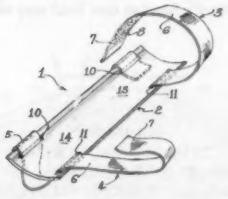


1. A limb protective covering comprising an elongate generally tubular, flexible, waterproof plastic member having at one end one of an integral foot and hand receiving member and at the other end an opening receiving the limb to be covered, an elongate strap-like closure member adapted to encircle the limb of a user below said opening, said closure member having an intermediate panel member fixed to a minor portion of the wall of said tubular member adjacent the said opening and first and second strap members extending from opposite ends of said panel member, said first member having a rigid loop on one end remote from the panel, the second strap member having mating engagement fabric portions thereon whereby the second strap may be passed through said rigid loop of the first member, tightened into a water-tight seal on the limb and engaged upon itself with the mating engagement fabric, a rigidifying panel corresponding generally to said intermediate panel to support the wall portion of the tubular member to which said intermediate portion is fastened and fastening means cooperating with said rigidifying panel and intermediate panel to fix the wall portion of the tubular member thereto.

4,254,766
SPLINTING DEVICE

Joel H. Kordis, 240 Emerald Dr., Vista, Calif. 92083

Filed Jul. 12, 1979, Ser. No. 56,818
Int. Cl.[3] A61F 5/04
U.S. Cl. 128—87 R 2 Claims



1. A splint for immobilizing a limb articulation of a patient which comprises:
a flat elongated rigid member;
first means for attaching the member to the patient's limb on one side of said articulation;
second means for attaching the member to the patient's limb on the opposite of said articulation;
each one of said first and second means for attaching comprising:
a separable strap, having on one side a first interlocking means and on the other side a second interlocking means cooperating with the first interlocking means to form a breakable fastener,
said strap having one end section engaged to the right side of the member through a first opening,
then running parallely to and underneath said flat elongated member, then passing through a second opening in the opposite side thereof,
the extremity of said end section being captured between the member and that portion of the strap running underneath the member,
the strap having no permanent means for securing it to the member.

4,254,767
LABORATORY DEVICE FOR SMALL ANIMALS

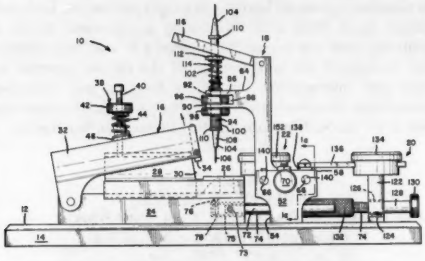
James L. Mixon, Jr., 5129 Irene Dr., Harrisburg, Pa. 17112

Filed Jul. 30, 1979, Ser. No. 61,640
Int. Cl.[3] A61M 5/00
U.S. Cl. 128—216 12 Claims

1. A device for use with laboratory animals comprising:
a. restraint means to confine and restrain the animal comprising an elongated tube, opened at both ends and into which the animal can enter, and a generally U-shaped shell opened at both ends, pivotally attached adjacent to the rear end of the tube and adapted to be rotated down over the tube and a clamping member fixed to the front end of the shell which extends forwardly of the front end of the tube and having a downardly facing, arcuate-shaped sur-

face which is placed against the nape of the animal's neck immediately behind its head; and

b. support means for a needle assembly on which a hypodermic-type needle may be removably placed, said support means including means to move the needle downwardly into the animal's head so that fluid may be injected thereinto.



4,254,768

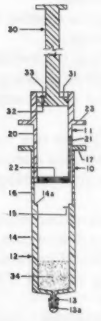
HYPODERMIC SYRINGE

Perla J. Ty, 3640 "B" S. Main St., Santa Ana, Calif. 92707

Continuation-in-part of Ser. No. 844,074, Oct. 10, 1977, abandoned. This application Sep. 14, 1979, Ser. No. 75,836

Int. Cl.³ A61M *5/00*

U.S. Cl. 128—218 M **9 Claims**



1. A multiple barrel hypodermic syringe, comprising: a lower barrel having an outlet port for a hypodermic needle; an upper barrel providing a removable hypodermic plunger at its upper end and a displaceable or frangible bottom seal at its lower end, the upper barrel being adapted to contain liquids or solids therein, the upper and lower barrels being sealed from each other solely by means of the bottom seal; the upper and lower barrels being sized for sliding engagement along their respective outer and inner peripheries; one or more grooves defining vent slots which connect the lower barrel interior solely to atmosphere, the vent grooves extending along a barrel periphery to permit gas, air and moisture to escape solely to atmosphere when the barrels are partly engaged, the vent slots being occluded to seal the lower barrel and its contents from the atmosphere, when the two barrels are substantially engaged; the upper and lower barrels being adapted to contain a liquid or solid, whereby disengagement of the barrels and hypodermic plunger enables separate removal and replacement of material from its respective barrel, without contamination of material in adjacent barrels.

4,254,769

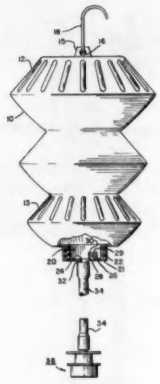
COLLAPSIBLE CONTAINER APPARATUS WITH AIR VENT AND SHUT-OFF VALVE

Vincent R. Sneider, 3422 Hallcrest Dr., Atlanta, Ga. 30319

Filed Jan. 24, 1980, Ser. No. 115,130

Int. Cl.³ A61M *3/00*

U.S. Cl. 128—227 **10 Claims**



1. A collapsible container for mixing and feeding fluid to a syringe for vaginal douches, enemas and the like, and as a combination including: (a) a collapsible container having a closed end and an open end; (b) an access opening formed in said open end; (c) a closure member adapted for the removably securing of said closure member to said access opening of the container, said closure member having a discharge means for carrying fluid through said closure member; (d) an automatically closeable vent means provided in said closure member, this vent adapted to admit air to the interior of the container when the container is brought to and into a condition of reduced pressure and to close said vent to fluid flow when the container approaches atmospheric pressure; (e) a flexible conductor secured at one end to the discharge carrier means provided on and by the closure member and at its other end said flexible conductor is removably secured to a selectively closeable valve; (f) this valve having a longitudinally movable outer tubular member having means for securing said flexible conductor to the valve so as to carry fluid to the interior of said valve; (g) a shut-off arranged in said valve and forming a portion of an inner member; (h) flange means on the movable valve components and providing manipulative means for opening and closing the valve to a flow of fluid; (i) means to limit the apart and together position of this valve, and (j) means for securing a nozzle on the discharge end of the valve.

4,254,770

APPARATUS AND METHOD FOR ALLEVIATING PHYSIOLOGICAL CONDITIONS BY DIRECTED SPRAY OF LIQUID TOWARD BODY TISSUE

Matlock M. Mims, Beverly Hills, Calif., assignor to Gregory Bergeron, Reno, Nev. and Robert J. Heiner, Playa Del Rey, Calif.

Continuation of Ser. No. 885,124, Mar. 10, 1978, Pat. No. 4,203,437. This application Sep. 27, 1979, Ser. No. 79,312

Int. Cl.³ A61M *3/00*

U.S. Cl. 128—229 **6 Claims**

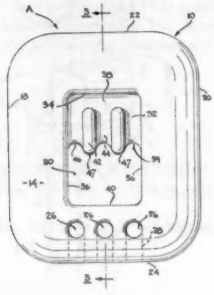
1. A therapeutic spray device for treating groin and anal areas of human beings to relieve prostate or vaginal or anal ailments and conditions thereof, said device comprising:

(a) a pad having an upper supporting surface with a large opening therein and defining at least a pair of spaced apart front and rear elements therein said pad capable of supporting the buttocks of an individual in an approximate

sitting position with relatively flat surfaces on said pad supporting portions of the thighs of such individual, or in position where the knees of the individual are supported on said relatively flat surfaces when in an approximate kneeling position,

(b) said pad having a generally vertical nozzle receiving aperture in the front of said spaced apart elements and which is spaced forwardly of said opening,

(c) a nozzle capable of being disposed in said aperture and capable of being connected to a source of liquid under pressure, said nozzle having at least one aperture located to be directed toward the groin and anal areas of a person



sitting or kneeling on said pad, said nozzle being located relative to a person disposed on said pad so that it is not readily adaptable for insertion in a body cavity and is capable of emitting a spray of said liquid toward said anal or groin areas to treat or alleviate at least prostrate or vaginal or anal ailments and with the waste liquid passing through said opening,

(d) connection means on said nozzle for connection to a source of liquid under pressure,

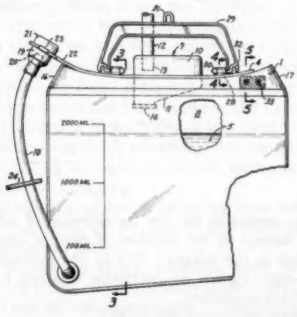
(e) and said pad having a groove means angularly disposed to said nozzle receiving aperture and intersecting said nozzle receiving aperture to receive said connection means.

4,254,771

FOLDED TOP URINE BAG WITH ELONGATED STIFFENING PANEL

Claude A. Vidal, Los Angeles, Calif., assignor to American Hospital Supply Corporation, Evanston, Ill.

Filed Aug. 25, 1978, Ser. No. 936,822
Int. Cl.³ A61F 5/44
U.S. Cl. 128—275 **23 Claims**



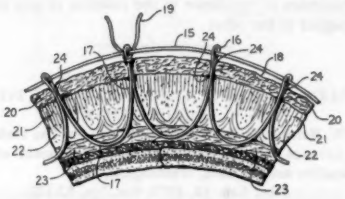
1. A urine collection bag with a liquid inlet and a folded over top adjoined to depending side walls, wherein the improvement comprises: a stiffening panel being generally horizontal in both its length and width directions with upwardly curving end portions and having a length substantially greater than its width, which panel is sealed to the bag along its top to horizontally spread apart a top portion of the bag to define a gas pocket immediately below the panel; a hydrophobic vent connected to the bag adjacent at least one of the upwardly curving end portions of the stiffening panel for venting the gas pocket; which panel has a pair of spaced apart anchor means for a hanger, and a flexible hanger connected to the pair of anchor means of the panel for suspending the bag with its gas pocket upright.

4,254,772

HAIRPIECE RETENTION SYSTEM AND METHOD OF APPLYING SAME

Thomas C. McNamee, 2451 Monaco Dr., Channel Island, Calif. 93030

Filed Nov. 5, 1979, Ser. No. 91,265
Int. Cl.³ A61B 17/00
U.S. Cl. 128—330 **5 Claims**



4. A method of firmly attaching a hairpiece to the scalp of a person having an outer surface layer and an integument comprising:

(a) surgically implanting a continuous suture in said integument characterized in that said suture forms loops at said outer surface, as it exits and reenters said integument, which orthogonally protrude from said surface;

(b) retaining said loops of said suture at said outer surface by threading one or more retention strands through said loops thereby providing a means for equally distributing stresses which may be subsequently applied to said loops; and

(c) binding said loops beneath said retention strands with a series of ties which extend outward from said loops thereby providing means for attaching said hairpiece to said scalp.

4,254,773

SWIVEL COUPLING FOR A CATHETERIZATION SYSTEM

Charles C. Waldbillig, Upper Arlington, Ohio, assignor to Medex Inc., Hilliard, Ohio

Filed Nov. 24, 1978, Ser. No. 963,184
Int. Cl.³ A61M 25/00
U.S. Cl. 128—348 **8 Claims**

7. In a catheterization system having a catheter to be fed in a tortuous path through a blood vessel, a source of fluid under pressure and a rotatable coupling connecting said fluid source to said catheter;

the improvement comprising a two-piece plastic swivel coupling in which;

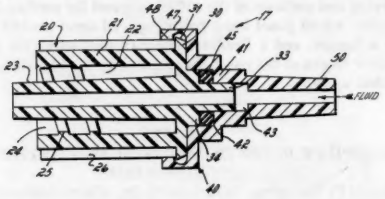
one piece has a recess and an O-ring disposed within said recess;

the other piece has a spigot projecting into said recess through said O-ring;

said O-ring having an interference fit between said spigot and said recess;

one of said pieces having a collar terminating in a radially

inwardly projecting lip of a first diameter, the other of said pieces having a circular flange of slightly greater diameter than said first diameter and underlying said lip when said pieces are forced together axially, whereby said pieces may be snap-fit together by applying axial pressure;



and means blocking axial movement of one piece with respect to the other to preclude axial compressing of said O-ring;

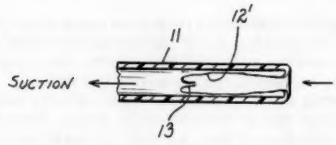
whereby said O-ring provides a fluid seal while presenting a minimum of resistance to the rotation of one piece with respect to the other.

4,254,774

BALLOON CATHETER AND TECHNIQUE FOR THE MANUFACTURE THEREOF

John W. Boretos, Rockville, Md., assignor to The United States of America as represented by the Department of Health, Education and Welfare, Washington, D.C.

Filed Feb. 14, 1979, Ser. No. 12,222
Int. Cl.³ A61M *25/00*
U.S. Cl. 128—348 **6 Claims**



1. A device for passage into a body vessel or passageway of diameter 1 mm or smaller comprising a unitary, integral and seamless balloon catheter of smooth uninterrupted contour having a single-lumen, flexible elongated catheter tube of diameter less than 40 mils integrally formed at one end with means to occlude the body vessel or passageway and comprising an inflatable balloon of one piece construction with said catheter tube having a wall thickness of less than 5 mils and sufficiently small relative to that of said tube to allow said balloon to be retracted by suction into said tube.

4,254,775

IMPLANTABLE DEFIBRILLATOR AND PACKAGE THEREFOR

Alois A. Langer, Pittsburgh, Pa., assignor to Mieczyslaw Mirowski, Owings Mills, Md.

Filed Jul. 2, 1979, Ser. No. 53,797
Int. Cl.³ A61N *1/36*
U.S. Cl. 128—419 D **29 Claims**

1. A cardioverter fully implantable in the body of a recipient, said cardioverter comprising:

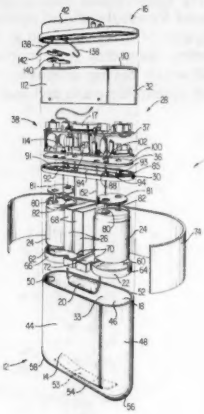
an outer casing;

first and second chambers within said outer casing, each of said chambers being hermetically sealed from the other, and being hermetically sealed from the exterior environment surrounding said casing;

battery means and energyy storage means disposed within said first chamber;

electrode terminal means disposed on said outer casing; and

defibrillator logic circuitry disposed within said second chamber and operatively associated with said electrode



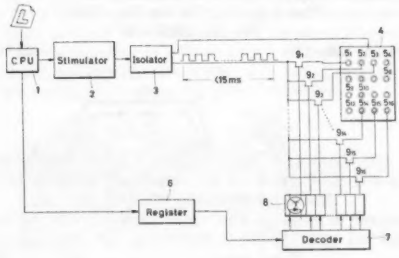
terminal means, said battery means and said energy storage means for charging said energy storage means to a level capable of defibrillating a malfunctioning heart, and for initiating the discharge of said energy storage means into the heart of said recipient.

4,254,776

APPARATUS FOR TRANSMISSION OF INFORMATION BY ELECTROCUTANEOUS STIMULI

Kazuo Tanie, Yokohama, and Susumu Tachi, Tokyo, both of Japan, assignors to Agency of Industrial Science & Technology, Japan and Ministry of International Trade & Industry, both of Tokyo, Japan

Continuation-in-part of Ser. No. 864,711, Dec. 27, 1977, abandoned. This application Jan. 29, 1979, Ser. No. 7,425
Claims priority, application Japan, Dec. 28, 1976, 51-159080
Int. Cl.³ A61N *1/36*
U.S. Cl. 128—421 **4 Claims**



1. An apparatus for the transmission of information to a human subject by the medium of electric stimuli selectively presented to the subject's skin by the application of closely spaced-apart signals to electrodes attached to the subject's skin, which comprises:

a central processing unit (CPU);

a stimulator coupled to the central processing unit for issuing pulse signals having the parameters of the information to be transmitted;

a plurality of electrodes for generating electrocutaneous stimuli to the subject in response to said pulse signals, wherein each of said electrodes includes an input for receiving the pulse signals;

an analog switch connected to each of said electrode inputs;

a first single isolator having its input connected to said stimulator and its output connected to the input of each analog switch of said electrodes.

a decoder having its input coupled to the CPU for sequentially controlling the "ON-OFF" operation of the respective analog switches; and

second isolators connecting said analog switches with said decoder so that the electric stimuli are selectively turned on and off by the CPU coupled to the decoder in pulsed intervals, whereby said analog switches are turned selectively.

4,254,777

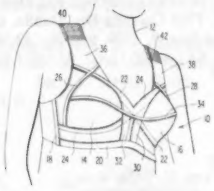
BRASSIERE FOR STRENUOUS PHYSICAL ACTIVITY

Elizabeth D. Johnston, 935 NW. 13th Ave., Gainesville, Fla. 32601

Filed Nov. 22, 1978, Ser. No. 963,069

Int. Cl.³ A41C *3/07*

U.S. Cl. 128—465 **4 Claims**



1. A brassiere for providing support for the breasts of a wearer comprising,

a. a front having a right cup and a left cup wherein said front is provided with

(1) first reinforcing facings extending from the top of said front below each armpit of said wearer to the bottom of said front,

(2) second reinforcing facing extending from said first reinforcing facing beside said right cup along the bottom of said front to said first reinforcing facing beside said left cup,

(3) third reinforcing facing extending from the top of said right cup across said front, under said left cup to said first reinforcing facing beside said left cup,

(4) fourth reinforcing facing extending from the top of said left cup across said front, under said right cup to said first reinforcing facing beside said right cup,

(5) fifth reinforcing facing extending from the top of each of said cups across said front between said cups to said second reinforcing facing between said cups,

(6) sixth reinforcing facing extending from the top of said right cup along the right side of said right cup to said fourth reinforcing facing,

(7) seventh reinforcing facing extending from the top of said left cup along the left side of said left cup to said third reinforcing facing,

(8) eight reinforcing facing extending from said sixth reinforcing facing across the outer contour of said right cup and said left cup to said seventh reinforcing facing,

b. a back panel extending from the side of said first reinforcing facings around the back of said wearer, and

c. wide straps extending from the top of said cups over the shoulders of said wearer to the top of said back panel.

4,254,778

IMAGING SYSTEMS

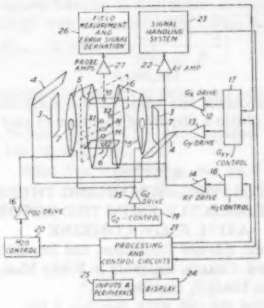
Hugh Clow, Maidenhead; Peter E. Walters, Southall, and William S. Percival, West Ealing, all of England, assignors to EMI Limited, Hayes, England

Filed May 22, 1979, Ser. No. 41,424

Claims priority, application United Kingdom, May 25, 1978, 22291/78

Int. Cl.³ A61B *5/05*

U.S. Cl. 128—653 **9 Claims**



1. A method of examining a body by nuclear magnetic resonance, including the steps of: applying to the body a steady magnetic field along an axis therein; applying a gradient field which, in conjunction with said steady field, gives a predetermined field in a slice of said body; in conjunction with the gradient field, applying a rotating magnetic field at the Larmor frequency for the field in the said slice to cause resonance therein; applying a second gradient field, 180° displaced in phase from the first and at a proportion of the magnitude thereof to reduce phase dispersion in said slice; applying a further magnetic field having a gradient across the slice in a chosen direction and sensing the resonance signal resulting from the slice during said further field, wherein, to reduce phase dispersion resulting from said fields, the first gradient field, rotating field, second gradient field and further field are repeated 180° displaced in phase.

4,254,779

BRAIN WAVE ANALYSIS APPARATUS FOR USE IN DIAGNOSING LIVING BODY CONDITIONS

Seiji Miyata, Ohi; Masatake Akagawa, Yachiyo; Masahiro Yamamoto, and Noboru Inoue, both of Tokyo, all of Japan, assignors to Asahi Medical Co., Ltd., Tokyo, Japan

Filed Jun. 9, 1978, Ser. No. 915,048

Claims priority, application Japan, Mar. 15, 1978, 53/30205

Int. Cl.³ A61B *5/00*

U.S. Cl. 128—731 **10 Claims**

1. A brain wave analysis apparatus for use in diagnosing living body conditions, comprising:

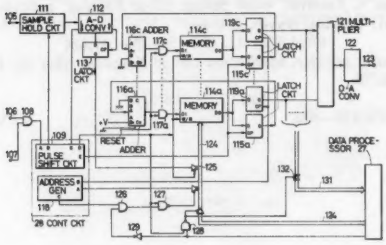
means for detecting brain waves from a living subject as an electrical brain-wave signal;

means for detecting the intervals between adjacent ones of the intersections of the brain wave signal with a predetermined level;

an accumulating storage unit for classifying the detected intervals according to magnitude and for accumulating and storing them to prepare a histogram;

a data processor for analyzing the histogram and calculating a standard deviation; and

display means for displaying variations in the standard deviation over a time period substantially longer than the time



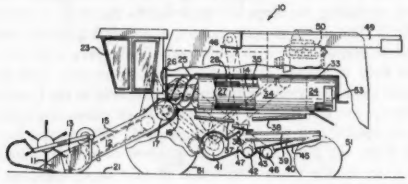
required to obtain one value of the standard deviation, thereby to obtain a display of the trend of said variations.

4,254,780

APPARATUS FOR DISCHARGING THRESHED MATERIALS DIRECTLY FROM THE ROTOR OF AN AXIAL FLOW COMBINE

Thomas E. Powell; Edward Donaldson, and Ronald F. McNeil, all of Brantford, Canada, assignors to White Motor Corporation of Canada Limited, Canada

Filed Jan. 10, 1979, Ser. No. 2,297
Claims priority, application Canada, Oct. 31, 1978, 315534
Int. Cl.[3] A01F *12/18*
U.S. Cl. 130—27 T **9 Claims**



1. In an axial flow combine having a threshing and separating rotor co-axially disposed in a generally cylindrical casing provided on the interior with guide vanes for imparting a generally helical movement to the crop material, the improvement comprising:

having portions of said casing terminating short of the discharge end of the rotor in progressively increasing angular widths in the direction of the discharge end whereby the threshed materials discharge in streams having angular widths substantially equal to the angular widths of said terminating portions.

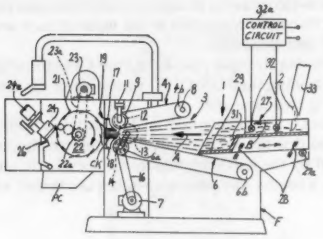
4,254,781

METHOD AND APPARATUS FOR DELIVERING PARTICLES OF TOBACCO TO SHREDDING MACHINES

Willi Thiele, Geesthacht; Klaus-Georg Hackmack, Hamburg, and Reinhard Hohm, Pinneberg, all of Fed. Rep. of Germany, assignors to Hauni-Werke Körber & Co. KG, Hamburg, Fed. Rep. of Germany

Filed Mar. 14, 1979, Ser. No. 20,520
Claims priority, application United Kingdom, Mar. 28, 1978, 11918/78
Int. Cl.[3] A24B *3/00, 3/18, 7/12, 7/14*
U.S. Cl. 131—111 **15 Claims**

1. In a method of comminuting particles of tobacco, such as ribs of tobacco leaves, wherein a stream of tobacco particles is built up at a location remote from and is transported lengthwise toward a cutting station, and wherein the stream is condensed during transport toward said station, the improvement which comprises the steps of transporting the stream lengthwise along a first substantially horizontal path; conveying particles of tobacco toward said location substantially in the longitudinal direction of said stream and along at least one second substantially horizontal path having a discharge end at



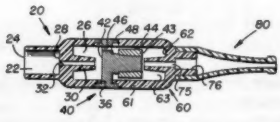
said location; and agitating the particles in the course of said conveying step, including vibrating the particles in said second path to thereby orient the particles so that at least the majority of particles which reach said location are substantially horizontal and extend substantially transversely of said stream.

4,254,782

TOBACCO SMOKE FILTER

Enrique C. Ligeti, 7700 Gardella Dr., Dublin, Calif. 94566

Filed Nov. 9, 1979, Ser. No. 92,651
Int. Cl.[3] A24F *13/02, 13/04, 5/04*
U.S. Cl. 131—187 **3 Claims**



1. A tobacco smoke filter having a plurality of detachably connected sections comprising:

(a) a cigarette receiving and holding section, said receiving section having a hollow cavity with a first end of the cavity open to receive a cigarette, a first expansion chamber downstream of said hollow cavity, first wall means defining a second end of the cavity and separating said cavity from said first expansion chamber, a longitudinally extending reduced diameter projection extending from said first wall and into the first expansion chamber, a first restricted bore extending on the longitudinal axis of the filter through said first wall and throughout the reduced diameter projection for communicating said cavity with said first expansion chamber;

(b) a heat dissipating section connected to said cigarette receiving section, a second wall means associated with the heat dissipating section and extending perpendicularly to said first restricted bore immediately downstream thereof, so that smoke passed through the first restricted bore is deflected by a first side of said second wall and circulated throughout the first expansion chamber, a solid projection extending longitudinally from a second side of said second wall, a second restricted passage extending through said second wall at a radially outward location to communicate smoke from said first chamber with the outer surface of said solid projection of the second wall, an air inlet opening located on an annular outer edge of said heat dissipating section downstream of said second wall;

(c) a rotatably adjustable air mixing section removably con-

nected to said heat dissipating section, said air mixing section having an annular outer wall having a larger inner diameter than the outer diameter of said second wall solid projection to define a second expansion chamber which has a third wall extending perpendicular to said second wall solid projection at a location downstream thereof, an annular inner shoulder formed on the extreme upstream end of said air mixing section, said annular inner shoulder having a series of spaced apart passages of different cross sections thereon, said passages adapted to be selectively placed in communication with said air inlet opening to conduct ambient air into the smoke stream for mixing therewith in said second expansion chamber, indexing means for positive engagement between said heat dissipating section and said air mixing section to selectively positively engage one of the spaced apart passages with the air inlet opening, and indicating means for indicating to the user of the filter device precisely which one of the varying sized spaced apart passages is in communication with the air inlet opening, said third wall having a centrally located restricted outlet bore extending longitudinally therethrough and into an enlarged diameter third expansion chamber formed in said third wall at the downstream end thereof; and

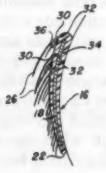
(d) a mouthpiece section attached to the air mixing section downstream of the third expansion chamber.

4,254,783

HAIR PIECE HAVING A COMB-SHAPED ATTACHING MEMBER

Sang J. Kim, 1 Campbell Ave., SW., Roanoke, Va. 24011

Filed Mar. 30, 1978, Ser. No. 891,646
Int. Cl.³ A45D *24/00*
U.S. Cl. 132—11 R **1 Claim**



1. A hairpiece for attaching natural looking artificial hair to existing hair, comprising

(a) anchoring means for frictionally engaging the natural hair by subdividing the natural hair into groups of generally elongated hair strands, said anchoring means including a comb shaped member having a plurality of semiflexible elongated tangs which are considerably stiffer than the artificial hair and a comb bridging means for interconnecting and positioning said elongated tangs in spaced apart parallel orientation to frictionally engage the natural hair by guiding the natural hair into the spaces between said tangs as the free ends of said tangs are moved into the natural hair, said tangs including a metallic core and a thermoplastic material coated over the entire surface of said metallic core;

(b) a plurality of strands of artificial hair, each said strand having a hair root, and

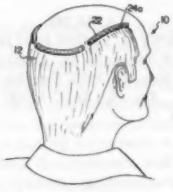
(c) hair root securing means for securing the roots of each said strand to said comb shaped member at a plurality of physically spaced hair root attaching sites evenly dispersed over the entire surface of one side of said comb shaped member including the entire surface of said comb bridging means and the entire surface of each and every tang on one side of said comb shaped member to approximate the dispersal of natural hair at a surface density of from 200 to 1000 hair roots per square inches, wherein the density of hair root attaching sites on each said tang is increased over the density of said hair root attaching sites on said comb bridging means by an amount proportional to the space between each said tang and the next adjacent tang to cause the overall density of hair roots within the area defined by the perimeter of said comb shaped member to be relatively constant, said hair roots at each said hair root attaching site being physically spaced from and out of contact with said hair roots attached at all remaining hair root attaching sites, said hair roots attached to said tangs being embedded solely in said thermoplastic material, whereby comb removing forces exerted on said strands of artificial hair attached by said hair root securing means to the free ends of said tangs will tend to pull the comb shaped member in a direction to further engage the comb tangs with the natural hair of the wearer.

4,254,784

METHOD AND APPARATUS FOR ATTACHING A HAIR UNIT

Charles W. Nelson, Kansas City, Mo., assignor to Apollo Hair Systems, Inc., Kansas City, Mo.

Filed Apr. 3, 1979, Ser. No. 26,783
Int. Cl.³ A41G *3/00*
U.S. Cl. 132—53 **18 Claims**



1. A hair unit assembly for attachment to the head of a recipient having at least some natural hair, said assembly comprising;

a hair unit including a base element, and a plurality of natural hair-simulating strands secured to said element; and

means for attaching said hairpiece to the recipient's head, including

at least one elongated tube configured to present a series of apertures along the length thereof for allowing strands of natural hair to be inserted within the interior of said tube;

locking means disposed within the interior of said tube for securing said tube to said strands of natural hair; and

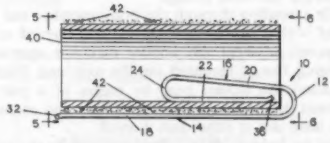
structure for connecting said hair unit to said tube.

4,254,785

HAIR ROLLER FASTENER

Charles R. Cochran, 120 S. Virginia St., Prescott, Ariz. 86301

Filed Aug. 17, 1979, Ser. No. 67,274
Int. Cl.³ A45D *6/16, 8/06*
U.S. Cl. 132—40 **3 Claims**



1. A hair roller fastener comprising,

a member formed of a single piece of spring steel and including a first component and a second component interconnected by a first bend,

the first component being relatively long, and constituted by a single element forming a first leg,

the second component being relatively short and consituted

by a pair of single elements that form a second leg and a third leg interconnected by a second bend,

both of said bends being continuous curves of substantial radius,

all of said legs being straight, and in the absence of anything between the components, being parallel,

the first bend being prestressed inwardly to bias the second component toward the first component and the second bend being prestressed outwardly to bias the third leg toward the first leg, the prestressed conditions of the bends being effective for positioning the third leg into engagement of the first leg throughout the length of the third leg in the absence of anything between those legs, and to bias those legs toward parallelism in the presence of anything between those legs,

the second bend and the first leg forming between themselves a bight for receiving objects and guiding them into position between the third leg and first leg, and the second bend being positioned remote from the free end of the first whereby the portion of the first leg beyond the second bend, and the curved surface of the second bend, form the surfaces defining the bight and are remote from any pointed element of the fastener, whereby, further, the fastener can be easily to a roller with hair rolled thereon without snagging the hair.

4,254,786

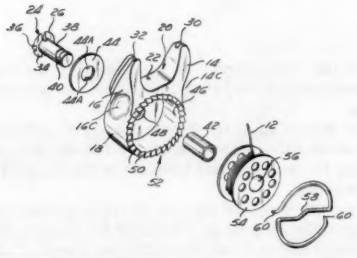
DENTAL FLOSS HOLDER

Se K. Won, 10401 S. Magnolia St., Anaheim, Calif. 92804

Filed Nov. 23, 1979, Ser. No. 96,996

Int. Cl.³ A61C *15/00*

U.S. Cl. 132—92 A **6 Claims**



1. A dental floss holder comprising:

a body member having an axial bore formed therein extending from one side thereof and terminating in an aperture of a smaller diameter opening onto the other body side,

said body means having a pair of prongs of generally triangular cross-section extending outwardly laterally from the body member normal to the bore and in the same direction and in generally parallel relationship to one another, each of said prongs having a deep floss receiving groove formed longitudinally along its outer surface remote from the other prong, and each prong terminating in a tip across which the groove extends toward the other prong;

an axle extending through the body member and having a head with a slot formed on one end thereof so as to be disposed adjacent the smaller diameter aperture and a floating flange mounted on the axle and fixed thereto adjacent the slotted head by means of a pair of teeth formed on the flange inner periphery and extending into the head slot at either end thereof;

a spool for holding dental floss mounted ôn the axle within the body member;

a passageway formed in the body member opening at one end between the prongs and at the other end into the axial bore for passing the floss from the spool through the body member;

a spring clip having downturned pointed arms; and

means formed on said axle remote from the slotted head for engaging said clip so that the clip arms engage unidirectional ratcheting recesses formed on said body adjacent the bore;

whereby the axle is normally fixed in position by engagement of the arms and recesses but may be unidirectionally rotated by application of manual rotary pressure to the clip.

4,254,787

COIN ACCUMULATION CYLINDER CHANGEOVER ALARM

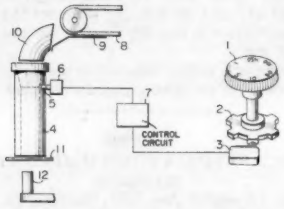
Kenkichi Watanabe, and Katusuke Furuya, both of Tokyo, Japan, assignors to Laurel Bank Machine Co., Ltd., Tokyo, Japan

Filed Aug. 14, 1979, Ser. No. 66,324

Claims priority, application Japan, Aug. 15, 1978, 53-111709[U]

Int. Cl.³ G07D *9/06*

U.S. Cl. 133—8 A **2 Claims**



1. A coin packaging machine which comprises a coin denomination selection handle, a rotary operation plate disposed co-operatively with the coin denomination selection handle, a coin denomination selection side switch to be opened or closed by said operation plate and a coin accumulation side switch to be opened or closed by mounting or dismounting an accumulation cylinder, and a changeover switch which is changed over to the side of an alarm circuit when the coin denomination selection handle is operated and which is changed over to the side of a starting circuit when one accumulation cylinder is dismounted, said starting circuit being adapted to energize a coin packaging machine starting relay when another accumulation cylinder is mounted whereby the machine cannot be started unless accumulation cylinders are dismounted and then re-mounted after an operation of the coin denomination handle.

4,254,788

ENERGY SAVING DISHWASHER

William F. Helwig, Jr., Downers Grove, Ill., assignor to Avtec Industries, Inc., Downers Grove, Ill.

Filed Sep. 19, 1979, Ser. No. 77,135

Int. Cl.³ B08B *3/10*

U.S. Cl. 134—57 D **12 Claims**

1. A control circuit for conserving electrical energy in a dishwashing machine comprising:

control means for automatically actuating various components during the operation of a dishwashing machine including a booster heater and a tank heater;

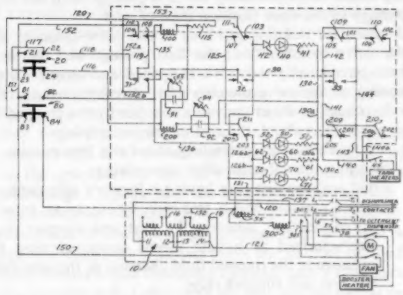
said control means being coupled to a source of electrical power and preventing simultaneous operation of the booster heaters and tank heaters of a dishwashing machine;

said control means further including connector means to couple the tank heaters and booster heaters to the power source to supply power thereto;

said control means further including an actuator means being responsive to the commencement of a cycle of operation of the dishwashing machine to simultaneously

interrupt the power directed to the tank heater and supply power to the booster heaters; and

delay means operatively coupled to said actuator means and the tank and booster heaters to interrupt power directed



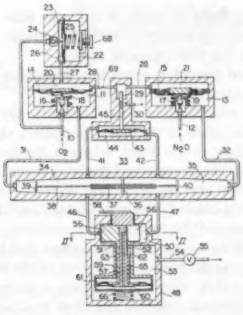
to the booster heaters and supply power to the tank heaters in a predetermined time interval after the actuator means senses the presence of the commencement of the cycle of operation of the dishwashing machine.

4,254,789

APPARATUS FOR MIXING MEDIA, SUCH AS GASES OR LIQUIDS

Johan E. H. Westberg, Lidingö, Sweden, assignor to AGA Aktiebolag, Lidingö, Sweden

Filed Feb. 5, 1979, Ser. No. 9,365
Claims priority, application Sweden, Feb. 23, 1978, 7802089
Int. Cl.³ G05D *11/03*
U.S. Cl. 137—88 **7 Claims**



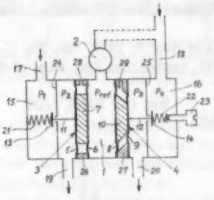
1. An apparatus for mixing two fluids in given proportions, said apparatus comprising first and second regulators, incorporated in respective supply lines for the two fluids, for reducing the fluid pressure of each of the two fluids to an operating pressure, and mixing means, including a common mixing chamber for receiving the fluids from said first and second regulators, said mixing means including first and second openings for controlling the flow of the respective fluid into said mixing chamber, and said apparatus further comprising means for controlling said first and second regulators such that the fluid pressures of the two fluids are equalized upstream of said openings, said mixing means further including control means for controlling the proportions of the two fluids passing through said first and second openings, said control means including a rotatable member whose angular position controls one dimension of the first and second openings ao as to control the proportions of the fluid, said mixing means further comprising flow responsive adjustment means for simultaneously providing the same change in a second dimension of said first and second openings in response to the total flow through said openings.

4,254,790

PRESSURE CONTROL UNIT FOR THE CONTROL OF THE PRESSURE OF AT LEAST ONE GAS DEPENDING ON THE PRESSURE OF ANOTHER GAS

Einer Eriksson; Johannes Jensen, both of Odense M., and Jorgen S. Lundsgaard, Troense, all of Fed. Rep. of Germany, assignors to Innoventa ApS, Denmark

Filed Aug. 30, 1978, Ser. No. 937,942
Claims priority, application Denmark, Aug. 30, 1977, 3849/77
Int. Cl.³ G05D *11/03*
U.S. Cl. 137—100 **3 Claims**



1. A pressure control apparatus for the simultaneous control of the pressure of at least two gases, said apparatus comprising:

means defining a reference pressure chamber to which a fluid at an adjustable pressure can be supplied,

means defining at least two control chambers positioned adjacent said reference pressure chamber, each of said control chambers having a gas inlet, a gas outlet and a valve means located therebetween, and

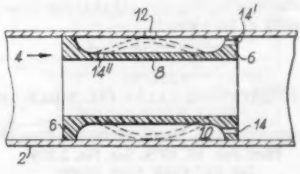
separate membrane systems positioned between each of said control chambers and said reference pressure chamber, each membrane system including a spring-loaded control valve extending into the adjacent control chamber so as to control gas flow through the respective valve means therein, and each membrane system comprising two spaced apart membranes which are mutually firmly interconnected, the surface areas of the respective membranes of each membrane system which face the reference pressure chamber being equal, whereas the surface areas of the respective membranes of each membrane system which face the respective control chambers differing, the membrane systems functioning such that the ratio of gas pressures emanating from the various control chambers will remain constant, said pressure ratio being determined by said differing surface areas of said respective membranes.

4,254,791

FLOW RATE REGULATOR

Dan Bron, 36 Palmach St., Haifa, Israel

Filed Mar. 14, 1980, Ser. No. 130,517
Claims priority, application Israel, Mar. 26, 1979, 56948
Int. Cl.³ G05D *7/01*
U.S. Cl. 137—118 **5 Claims**



1. An in-line flow regulator for pressurized fluids, comprising a regulator sleeve disposed in a tubular, fluid-carrying line or in constituent parts thereof, said line or constituent part

thereof communicating with the outside via at least one wall orifice provided therein, which sleeve is constituted by two flange-like end portions fitting said tubular line and a central portion connecting said flange-like portions, in such a way as to define, in conjunction with said flange-like portions and with the inside wall of said tubular line, an annular output space wherein said central portion is elastically deformable by an inflatory force and wherein said annular output space communicates with the inside of said tubular line via at least one of said portions, and with the outside via said wall orifice.

4,254,792

DOUBLE-SEAT VALVE

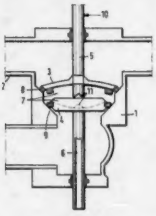
Hermann Schädel, Ergste, Fed. Rep. of Germany, assignor to Holstein & Kappert GmbH, Dortmund-Wambel, Fed. Rep. of Germany

Filed Aug. 9, 1979, Ser. No. 65,396

Claims priority, application Fed. Rep. of Germany, Aug. 26, 1978, 2837298

Int. Cl.³ F16K *1/00*

U.S. Cl. 137—240 **7 Claims**



1. A double-seat valve, comprising a housing, a movable shaft; means forming a first and second valve seat in said housing; one valve member fixedly mounted on said shaft in one mounting point; another valve member fixedly mounted also on said shaft in another mounting point and having a sealing element which forms a seating face arranged to abut against said first valve seat when said shaft together with said valve members moves to a closed position and to be lifted from said first valve seat when said shaft together with said valve members moves to an open position of the valve, said other valve member being movable independently of and relative to said one valve member and being variable so that said seating face of said other valve member is displaceable relative to the other mounting point and abuts against said one valve member to thereby form a hollow chamber between said valve members, said sealing element of said other valve member being so deformable that after a predetermined stroke of said other valve member in one direction, said seating face of said other valve member first abuts against said one valve member to thereby form said hollow chamber between said valve members, and thereafter said other valve member and said one valve member are lifted from said first and second valve seat respectively; and a draining conduit communicating with said hollow chamber prior to the valve members being lifted toward said open position so that fluid leaking into said chamber flows out of the latter outwardly of the valve.

4,254,793

BALL VALVE HAVING VALVE CHAMBER VENTING SEAL ASSEMBLIES

Domer Scaramucci, 3245 S. Hattie, Oklahoma City, Okla. 73129

Filed Jan. 15, 1979, Ser. No. 3,379

Int. Cl.³ F16K *5/00, 25/00*

U.S. Cl. 137—246.22 **21 Claims**

1. A valve, comprising:

a body having formed therein a first passage and a second passage to provide inlet and outlet passages for the valve, and having formed therein a valve chamber interposed between the first passage and the second passage;

a valve member supported in the valve chamber for rotation between open and closed positions, the valve member having means communicating the first passage with the second passage in the open position thereof; and

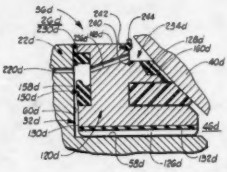
seal means for isolating portions of the valve chamber about the valve member from the first passage and the second passage, whereby the valve is opened and closed via positioning of the valve member and whereby portions of the valve chamber about the valve member from a trapped fluid chamber thereabout, the seal means comprising:

a first seal assembly extending about the first passage and engaging the valve member, comprising:

a first seal support ring having a forward side facing the valve member and a rear side facing away from the valve member, wherein the first seal support ring is characterized as having means communicating fluid pressure in the trapped fluid chamber to the rear side of the first seal support ring;

a first sealing ring attached to the forward side of the first seal support member for sealingly engaging the valve member;

first biasing ring means extending about the first passage adjacent the rear side of the first seal support ring for venting fluid pressure at the rear side of the first seal support ring in excess of fluid pressure in the first passage to the first passage; and



a second seal assembly extending about the second passage and engaging the valve member.

19. A valve according to claim **1** wherein the body has a first sealant port mounted in the outer periphery thereof for introduction of sealant in the body; wherein the first sealing ring is radially displaced a preselected distance from the first passage, whereby the first seal support ring, the valve member and the first sealing ring coact to form a first sealant channel adjacent the forward side of the first seal support ring, the first sealant channel extending about the first passage and having an annular opening thereinto between portions of the first seal support ring and the valve member; wherein a plurality of sealant passages are formed through the first seal support ring and intersect the first sealant channel; wherein a sealant passage communicating with the sealant passages in the first seal support ring is formed through the body and communicates with the first sealant port, whereby sealant can be injected into the first sealant channel via the first sealant port and the sealant passages formed in the first seal support ring and the body; and wherein the first seal support ring is characterized as comprising means restricting the opening of the first sealant channel into the first passage.

4,254,794

VALVE FOR SELF-MAINTAINING POULTRY WATERER

Fred R. Smith, Fresh-Flow Systems, Inc., P. O. Box 265, Comer, Ga. 30629

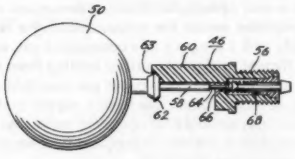
Filed Jan. 2, 1979, Ser. No. 75

Int. Cl.³ F16K *31/18;* A01K *7/04*

U.S. Cl. 137—434 **2 Claims**

1. In a watering system comprising means supplying water under pressure, at least one watering trough having float-controlled valve means for controlling the flow of water into said

trough and maintaining a predetermined water level therein, conduit means for delivering water from said supplying means to said watering trough through said float-controlled valve means and controllable valve means for shutting off the flow of water in said conduit, in which at least a portion of said conduit in the length thereof between the controllable valve means and the trough is located above the level at which water enters the trough through said float-controlled valve means, and in which said float-controlled valve means comprises a housing having an inlet opening connected to receive water from said conduit, and a discharge opening arranged to discharge water into said trough, a valve seat surrounding said discharge opening on the upstream side thereof, a valve pin extending through said discharge opening into the interior of the housing and having an annular resilient valve seal disposed at its end on the upstream side of said discharge opening, said valve seal being arranged to cooperate with said valve seat to close off the flow of water through said discharge opening, and a float secured on the opposite end of said valve pin and adapted to rest on the surface of the water in said trough, the float, valve pin and valve seal being so arranged that, at a particular water level in the trough, the valve seal may be held against the valve seat by the pressure of water in said conduit so that the flow of water into the trough is cut off, the improvement comprising spring means located within said housing and acting on the end of the valve pin therein, said spring means continuously urging said valve seal in the direction toward said valve seat, and preventing said valve seal from moving away from said valve seat when the water in said trough is at said particular level, whereby water from said portion of the conduit located above the level at which water enters the trough is prevented from entering the trough when said controllable valve means is closed off and the water in said trough is at said particular level, and elongated pin means aligned with said valve pin when said valve seal is in its closed condition, and guide means supporting said elongated pin means for sliding movement in the longitudinal direction, said elongated pin means being engageable with the end of said valve pin when said valve seal is in its closed condition, and said spring means being arranged to urge said elongated pin means against said valve pin and in which said guide means is in the form of a sleeve supporting said elongated pin means for sliding movement in the longitudinal direction, said elongated pin means has a first enlarged end on one side of said sleeve, said first enlarged end being engageable with the end of said valve pin when said valve seal is in its closed condition, and a second enlarged end on the opposite side of said sleeve for preventing disengagement of said elongated pin means from said sleeve, said spring means is in the form of a coil spring surrounding said elongated pin and compressed between said first enlarged end and an end of said sleeve and arranged to urge said elongated pin means against said valve pin, the assembly comprising said elongated pin means, said guide means and said spring means forming part of the wall of said housing and being removable from said housing as a unit.

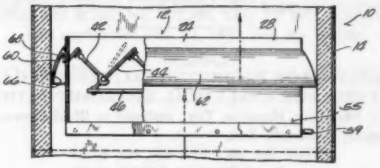


4,254,795

AIRFLOW CONTROL MECHANISM INSERTABLE INTO AN AIR DUCT

John C. McNabney, Verona, Wis., assignor to Wehr Corporation, Milwaukee, Wis.

Filed Apr. 6, 1979, Ser. No. 27,673
Int. Cl.³ F23L *13/08*
U.S. Cl. 137—454.6 **7 Claims**



1. An air flow control mechanism for use in an air duct having upstream and downstream ends and an aperture in the air duct intermediate the upstream and downstream ends, the air flow control mechanism comprising:

a housing adapted to be slideably inserted through the aperture into the air duct, said housing including a plurality of side walls positionable adjacent the interior surface of the duct but in spaced relation from the interior surface of the duct,

means for supporting said housing in the air duct, said supporting means including a flange fixedly attached to said housing and for surrounding the aperture, the flange being adapted to be fixed to the air duct, and

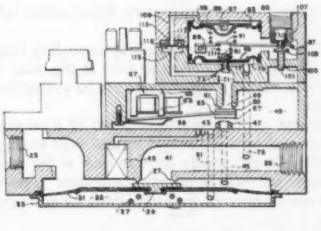
means for providing a seal between the housing and the interior surface of the air duct for preventing air flow around the housing, said seal means including elongated resilient blades fixedly attached to the external surface of the housing and engageable against the internal surface of the air duct, said resilient blades each including one longitudinal edge secured to said housing and an opposite longitudinal edge engageable against the interior surface of the air duct, and said blades each being curved toward the air flow whereby air pressure against said blades forces said opposite longitudinal edges against the interior surface of the air duct.

4,254,796

GAS REGULATOR VALVE WITH STEP OPENING CHARACTERISTIC

Samuel T. Kelly, Torrance, Calif., assignor to Robertshaw Controls Company, Richmond, Va.

Filed Oct. 18, 1979, Ser. No. 86,166
Int. Cl.³ F16K *31/365*
U.S. Cl. 137—489 **10 Claims**



1. In a step opening gas pressure regulating valve having a housing with inlet and outlet ports separated by a main diaphragm valve with a main valve diaphragm chamber and including a bleed chamber within said housing in communication with said main valve diaphragm chamber with a bleed

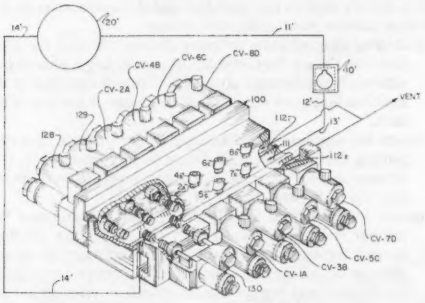
chamber inlet gas passageway containing a gas bleed orifice and a bleed chamber outlet gas passageway whereby said main valve responds to gas pressure in said bleed chamber and wherein a step opening diaphragm is mounted in a step opening diaphragm chamber which communicates with the bleed chamber through a time delay orifice and gas flow control means responsive to said step opening diaphragm is mounted in one of said inlet and outlet gas passageways, the improvement which comprises check valve means bypassing said time delay orifice to vent said step opening diaphragm chamber and thereby provide rapid resetting of step opening diaphragm.

4,254,797

APPARATUS FOR PRODUCING CALIBRATION GASES SUITABLE FOR ANALYTICAL INSTRUMENTATION

Paul H. Mayeaux, Houston, Tex., assignor to Bi-M Instrument Company, Houston, Tex.

Filed Jan. 26, 1979, Ser. No. 6,664
Int. Cl.³ G05D 7/06; G01M 27/00
U.S. Cl. 137—565 **12 Claims**



1. A multicomponent valve assembly for use in a system for blending accurately measured predetermined quantities of gaseous components received directly from separate pressurized supply tanks, as on input signals received from a computer, the system including a mixing vessel, a pressure transducer associated with said vessel for measuring the pressure of the gases in said pressure vessel, producing an output signal in response to the measured pressure and transmitting same to said computer, and a circulating pump connected in a closed series via conduits which form a circuit, the multi-component valve assembly operatively communicating the two ends of the conduits for flow of gas therethrough in providing the functions of purging contaminants from the system, admixing the gaseous components received from the supply tanks to form the gaseous blend, producing a product output blend of the admixed gases, and venting gases from the system, which comprises:

a housing constituted of an elongate block within which is provided

an axially oriented vent passageway extending longitudinally through the block to an inlet at the outer end of said block, through which gases can be vented from the system,

a component gas manifold comprised of a passageway, axially oriented and parallel to said vent passageway, extending longitudinally from an inlet at the outer end of said block, within which component gases of the blend can be injected, and circulated for admixing said gases,

a plurality of spaced apart valve seat openings, each extended from an inlet at the surface of said block laterally through said vent passageway to said component gas manifold to which it is communicated via an orifice leading into said component gas manifold,

a mix valve which can be opened and closed as by signals received in programmed sequence from said computer, mounted on said block over a valve seat opening, an end of the conduit from said mixing vessel being communicated with said valve seat opening, the valve being sufficient to open and close the orifice leading from said valve seat opening into said component gas manifold to open or cut off communication with said mixing vessel via said conduit extended therefrom,

a product output valve which can be opened and closed as by signals received in programmed sequence from said computer, mounted on said block over a valve seat opening which is communicated via a conduit with a gas receiving source external to said system, the valve being sufficient to open and close the orifice leading from said valve seat opening to said component gas manifold so as to open or cut off communication between said component gas manifold and said receiving source conduit,

a vent valve which can be opened and closed as by signals received in programmed sequence from said computer, mounted on said block over a valve seat opening, and an outlet communicating the component gas manifold via the orifice within the valve seat opening with said vent passageway, the valve being sufficient to close the orifice of said valve seat opening to cut off communication between said component gas manifold and vent passageway or open said orifice and thereby open communication between said component gas manifold and vent passageway so that gas can be flowed freely through the component gas manifold,

a plurality of component gas valves, each of which can be independently opened and closed as by signals received in programmed sequence from said computer mounted on said block each over a valve seat opening, to each adjacent valve seat opening of which is connected a gas inlet which provides means for communicating a component gas supply tank for supply of a component gas, each valve being sufficient to close the orifice leading from said valve seat opening into said component gas manifold to cut off the flow of a component gas from a supply tank into the component gas manifold, or open said valve seat orifice so that a component gas can be supplied by a supply tank to the component gas manifold,

whereby the system can be purged in a cycle which includes opening the vent valve, closing all other valves, and then starting the pump to exhaust gas from the system, after which the pump can be stopped, the vent valve closed, and a component valve opened to provide the system with a component gas, this cycle being repeated a number of times to purge the system, and at the time the system is exhausted of gas on the last step of the cycle each component gas can be serially injected into the system by sequentially opening and closing the respective gas component valve to inject the gases of the blend and, on closing the component valve of the last gas to be added to the blend, the mix valve can be reopened, the pump again turned on to circulate, mix and thoroughly homogenize the gaseous blend, and the product output valve can then be opened to transfer the gas blend to a receiving source.

4,254,798

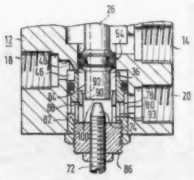
DIRECTIONAL CONTROL VALVE

Helmut Ott, Stuttgart, Fed. Rep. of Germany, assignor to Herion-Werke Kg, Fellbach, Fed. Rep. of Germany

Filed Jan. 9, 1979, Ser. No. 2,186
Claims priority, application Fed. Rep. of Germany, Mar. 23, 1978, 2813030
Int. Cl.³ F15B 13/043
U.S. Cl. 137—625.66 **5 Claims**

1. In a direction control valve, particularly for use in connection with a pneumatic load, a combination comprising a housing having a first load port, a second load port, a pressure port and a control port and formed with a central opening; a control piston movable in said opening along said ports; a

single venting port, said control piston having an end portion, and being formed with an axial boring adapted to communicate with said venting port and a radial boring arranged in communication with said axial boring and adapted to communicate with one of said load ports to connect the same with said venting port, a channel defined by said axial boring adapted to connect said second load port with said venting port; and



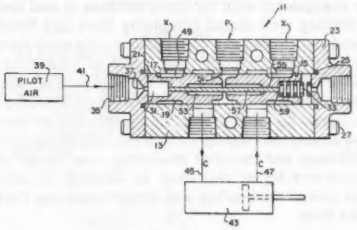
throttling means including an adjustable throttling bolt, said end portion of said control piston being provided with a tubular projection with an outer edge facing said throttling bolt and having a central passage being in axial alignment with said axial boring, and further including an axially displaceable throttling collar cooperating with the outer edge of said tubular projection to produce an adjustable gap for said second load port.

4,254,799

LAPPED SPOOL VALVE ASSEMBLY

Leland F. Blatt, 31915 Groesbeck Hwy., Grosse Pointe Shores, Mich. 48026

Filed Apr. 25, 1979, Ser. No. 33,099
Int. Cl.³ F15B *13/042*
U.S. Cl. 137—625.69 **5 Claims**



1. A valve assembly comprising an elongated body having an axial bore defining an annular valve seat, said bore being honed to a fine finish;

axially apertured end caps sealed over and secured to opposite ends of said body;

said body having a pressure port, cylinder ports and exhaust ports, all with associated passages communicating with said bore;

a valve spool assembly reciprocally and snugly nested and sealed within said bore;

said spool assembly being honed to a fine finish to match the bore with a minimal clearance;

annular portions of said spool assembly sealingly engaging said bore controlling the flow of pressure fluid through the respective bores and passages;

said spool assembly having a central fluid shut-off position and a pair of fluid control positions;

means on said body for alternatively positioning said spool axially into one of said control positions;

said spool assembly including a pair of spaced symmetrical oppositely arranged axially aligned spools; and

means flexibly interconnecting said spools;

the length of the spools relative to said bore, providing flexibility of the spools within said bore;

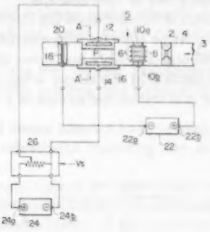
said interconnecting means including a wire axially extending loosely through said spools and at its ends secured to said spools respectively.

4,254,800

FLUID FLOW RATE CONTROL APPARATUS

Kenji Masaki, Yokohama, Japan, assignor to Nissan Motor Company, Limited, Yokohama, Japan

Continuation of Ser. No. 801,394, May 27, 1977, abandoned.
This application Jun. 13, 1979, Ser. No. 48,080
Int. Cl.³ F15D *1/02*
U.S. Cl. 137—827 **5 Claims**



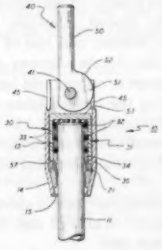
1. Apparatus for controlling the amount of fluid flowing through a duct comprising, means defining an orifice in said duct to define a maximum flow rate of the fluid flowing through said duct, first means disposed downstream of said orifice for ionizing a fluid stream having flowed through the orifice in said duct, second means disposed about the path of said ionized fluid stream and downstream of said first means for establishing a field having a transverse force component in said fluid stream to constrict the ionized fluid stream by interaction between the charges in said fluid stream and said transverse force component of the field against an inner surface of said duct to thereby offer resistance to the ionized fluid stream, and third means for varying the magnitude of said field in response to an external signal applied thereto.

4,254,801

QUICK-ACTING CLOSURE UNIT

Bernard P. Gerthoffer, 304 Cornwall Dr., and John S. Kolwaite, 101 Dunham Rd., both of DeWitt, N.Y. 13214

Filed May 31, 1979, Ser. No. 44,117
Int. Cl.³ F16L *37/18, 55/10*
U.S. Cl. 138—89 **10 Claims**



1. A quick-acting closure device for temporarily sealing off the open end of a line used to convey fluids under pressure including

a hollow sleeve having a cylindrical upper section and an

inwardly tapered lower section that is capable of being passed over the open end of a line,

collapsible jaw means slidably contained within the lower section of the sleeve that encircles the line, said jaw means being collapsible in a radial direction to grip the line therein when the jaw means is moved downwardly within the tapered section of the sleeve,

a cup that is slidably contained within the upper section of the sleeve that is adapted to pass over the open end of the line so that the rim of the cup is able to move into contact with the jaw means,

a compressible seal means contained within the cup that surrounds the line and is arranged to be compressed between the cup and the jaw means as the cup is moved downwardly in the sleeve to provide a fluid-tight seal about the open end of said line and

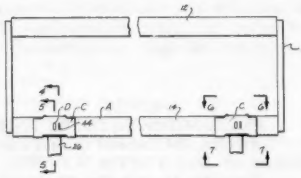
a camming means acting between the sleeve and the cup that is adapted to force the cup downwardly in the sleeve to compress the seal assembly and drive the jaw means into the tapered section of the sleeve whereby the jaw means grip the line and secure the device in a sealing condition.

4,254,802

APPARATUS FOR REINFORCING A HEDDLE FRAME SLAT OF A LOOM

Frank H. Kaufmann, and Charles F. Kramer, both of Greenville, S.C., assignors to Steel Heddle Manufacturing Co., Greenville, S.C.

Filed May 17, 1979, Ser. No. 39,952
Int. Cl.³ D03C *9/06*
U.S. Cl. 139—91 **3 Claims**



1. A reinforced frame slat for a heddle frame of a weaving loom, wherein the heddle frame slat is of the type which includes a lightweight tubular construction having a hollow slot portion defined by spaced sidewalls, latch means carried within said hollow portion, and one of said edges having an elongated slot opening therein whereby drive connector means may be inserted therein to engage said latch means for supporting and reciprocating the heddle frame during shedding, said reinforced frame slat comprising:

notch means formed in said frame slat sidewalls defined by an area of said sidewall being cut out and removed therefrom;

elongated reinforcing plate means carried on the sidewalls of said frame slats in the area of said slot opening overlying said notch means; and

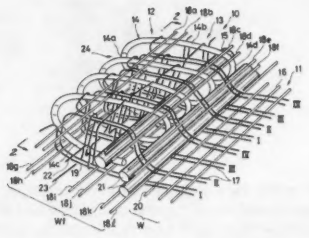
said notch means being formed in an area of said sidewalls generally overlying said latch means enabling contact between said plate means and said latch means to facilitate integral connection therebetween reinforcing said frame slat during reciprocation.

4,254,803

WOVEN STRINGER FOR SLIDE FASTENERS

Noritaka Tsubata, Uozu, Japan, assignor to Yoshida Kogyo K K, Tokyo, Japan

Filed Jul. 18, 1979, Ser. No. 58,688
Claims priority, application Japan, Jul. 28, 1978, 53-92993
Int. Cl.³ A44B *19/10*
U.S. Cl. 139—384 B **4 Claims**



1. A woven fastener stringer comprising a woven tape formed with foundation warp and weft threads and consisting of a web section defining a major dimension of said tape and a woven filament section defining a longitudinal edge portion of said tape; a row of successively interconnected elongated loops woven into said filament section and interengageable with another row on a mating stringer, each of said loop having a coupling head at one end thereof, an upper leg and a lower leg extending from said head in a common direction, and a heel portion remote from said head connected to a next adjacent one of said successive loops; a plurality of covering warp threads overlying and under lying said loops; a stuffing cord extending longitudinally of the tape through said row of loops; at least one guide cord extending longitudinally of the tape in abutting engagement with the outer surfaces of said heel portions; a binding weft thread continuing from said foundation weft thread and interwoven with said covering warp threads in said woven filament section; and a pair of tensioning warp threads extending longitudinally of the tape between said covering warp threads, one of said tensioning warp threads passing over the upper leg of said loop, down through an inter-loop space and around the binding weft thread underlying the lower leg of said loop, and the other tensioning warp thread passing under the lower leg of said loop, up through an inter-loop space and around the binding weft thread overlying the upper leg of said loop.

4,254,804

FILLING DEVICE FOR FILLING CONTAINERS

Yoshinobu Wada, Matsutoh, and Shigeru Yoshida, Kanazawa, both of Japan, assignors to Shibuya Kogyo Company, Ltd., Kanazawa, Japan

Filed May 18, 1979, Ser. No. 40,371
Claims priority, application Japan, May 19, 1978, 53-59783
Int. Cl.³ B65B *3/26*
U.S. Cl. 141—40 **7 Claims**

1. An apparatus for filling bottles having open mouths, which comprises:

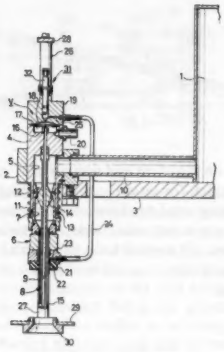
a source of liquid to be filled into bottles;

a filling tube having an upper portion in liquid flow communication with said source and a lower portion receivable through the open mouth of a bottle so that liquid can flow from said source through said filling tube into the bottle;

an exhaust tube extending through said filling tube, the lower end of said exhaust tube being adapted to extend into and communicate with the interior of the bottle and the upper end of said exhaust tube being adapted to communicate with the ambient atmosphere so that air can be discharged from the bottle while the bottle is being filled with the liquid;

a sealing member surrounding said filling tube and adapted for sealing the perimeter of the open mouth of the bottle;

means defining pressure detecting port means located and arranged to communicate with the interior of the bottle when said bottle is sealed by said sealing member so that the internal pressure of the bottle is applied to said port means;



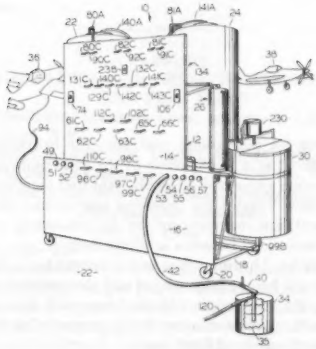
a first valve movable between open and closed positions for controlling the flow of liquid from said source into the bottle and means connecting said first valve for actuation to its closed position in response to an increase of pressure at said port means, caused when the level of the liquid in the bottle has risen so as to block the lower end of said exhaust tube, whereby to stop flow of liquid into the bottle.

4,254,805

CLOSED CHEMICAL MIXING SYSTEM

Harold E. Reeder, England, Ark., assignor to Load Safe Systems, Inc., Heber Springs, Ark.

Filed Mar. 8, 1979, Ser. No. 18,450
Int. Cl.³ B05B *7/26*; B65B *31/00*
U.S. Cl. 141—59 **6 Claims**



1. A closed agri-chemical mixing and transferring system comprising:

a generally upright chassis adapted to be disposed upon a supporting surface;

means disposed within said chassis for generating partial vacuum;

vacuum manifold means for distributing partial vacuum, said manifold means in fluid flow communication with said vacuum generating means;

a plurality of chemical holding tanks for storing and outputting concentrated agri-chemicals;

a plurality of vacuum switching valves in fluid flow communication with said vacuum manifold means for selectively imparting partial vacuum to as desired holding tank to be loaded with chemical concentrate independently of the operation of others of said holding tanks;

a plurality of probe inlet couplings accessible from said chassis and adapted to be connected to external probes for receiving chemical concentrate;

a plurality of probe inlet switching valves in fluid flow communication between said holding tanks for selectively establishing fluid flow communication between said holding tanks and said probes independently of the operation of others of said holding tanks whereby partial vacuum within said holding tanks draws chemical concentrate thereinto;

vacuum vent means for venting preselected ones of said holding tanks after loading said tanks with chemical concentrate;

transfer manifold means adapted to be connected to a source of water for selectively receiving the contents of said holding tanks;

a plurality of dump valves for selectively transferring the contents of a desired holding tank into said transfer manifold means independently of the operation of others of said holding tanks;

transfer pump means for transferring liquids reaching said transfer manifold means to an external sprayer apparatus to be loaded;

means for selectively rinsing preselected ones of said holding tanks independently of the operation of others of said holding tanks, said rinsing means comprising:

fresh water manifold means adapted to be connected to an external, pressurized source of water;

a plurality of rinse valves for individually transferring water from said fresh water manifold means to a preselected holding tank to be rinsed; and,

rotatable sprayer means disposed internally of each holding tank for forcefully rinsing substantially the entire surface area within said holding tank in response to water pressure; and,

powder box means for mixing dry chemical concentrate and dispensing liquid solution, said powder box means comprising:

container means into which dry chemical concentrate may be poured for subsequent mixing;

powder box dump valve means for connecting said powder in fluid flow communication with said transfer manifold; and

powder box agitation valve means connected between the output of said transfer pump and said powder box whereby the contents of said powder box may be continuously recirculated between said powder box and said transfer manifold, thereby mixing said dry chemical concentrate.

4,254,806

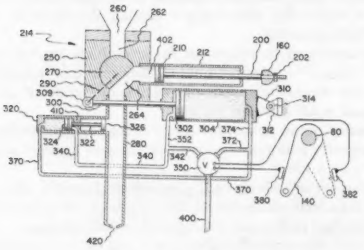
APPARATUS FOR FILLING CAULKING TUBES IN A CLEAN MANNER

Robert M. Elsworth, Mail Box 19, Georgetown, Exuma, The Bahamas, assignor to Robert M. Elsworth, Loudonville, N.Y.

Filed Apr. 25, 1979, Ser. No. 33,113
Int. Cl.³ B65B *3/04*
U.S. Cl. 141—116 **11 Claims**

1. The filling portion of an apparatus for filling caulking tubes such that filling caulking tubes with a liquid composition such that the filling portion of the apparatus prevents material from leaking onto the caulking tubes so as to dirty the caulking tubes when material is not being forced into the caulking tubes, comprising

a frame;
a drive means located on the lower portion of said frame;
reservoir means located on the upper portion of said frame having therein stored a liquid composition;
blocks means located beneath said reservoir means and valve core means within said block means, said valve core means comprising a cylindrical shaft with cavities or passageways in said shaft for the passage of said liquid composition from said reservoir means through said block means and said valve core means;
first piston and cylinder means located adjacent to said block means receiving measured quantities of said liquid composition from said reservoir means through said block and valve core means, said first piston means and said valve core means being activated by said drive means;
passage tube means located beneath said block means for allowing measured quantities of said material to pass from said first cylinder and piston means through the cavities or passageways in said valve core means into said passage tube into empty caulking tubes;
suck-back means located on such passage tube means for preventing material from leaking out of said passage tube



means when material is not being forced into caulking tubes, second and third piston and cylinder means which are activated by said drive means and which drive said suck-back means through a second valve means; and
wherein said suck-back means comprises said third piston and cylinder means comprising a horizontal tube perpendicularly connected to said passage tube means having therein a suck-back piston such that when the suck-back piston is activated by air pressure through said second piston and cylinder means by means of said second valve means to retract in a direction away from said passage tube when the material is not forced through such passage tube into said caulking tubes so that there is created a suction effect in such passage tube so as to prevent said composition from leaking out downward from said passage tube means and where said second valve means causes air pressure to force said suck-back piston and said third piston and cylinder means such that said suck-back piston is forced by said third piston and cylinder means so as to eliminate the suction effect when the composition is being forced through said passage tube into said caulking tubes.

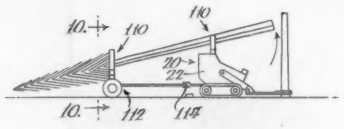
4,254,807

TREE HARVESTING APPARATUS AND METHOD

Frank J. Tucek, Wausau, Wis., assignor to J. I. Case Company, Racine, Wis.

Filed Jul. 28, 1978, Ser. No. 928,813
Int. Cl.³ A01G *23/08*
U.S. Cl. 144—34 E **9 Claims**

1. Tree harvesting apparatus, comprising: a vehicle having a frame and propulsion means for moving said frame; first arm means and second arm means fixedly pivotable on said frame, said first arm means and said second arm means each including at least one pair of links pivotally joined together, each pair of links including a first link pivoted on said frame adjacent one end thereof and a second link having one end pivoted on the free end of said first link, with a further link interconnecting said free ends of said second links, said first and second links pivoting between first and second positions; means, connected to said first links, for normally maintaining said first and second link in said first position, said links when in said first position defining an open pocket for receiving a standing tree; and



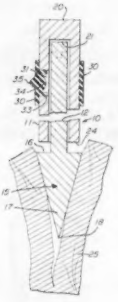
cutter means, on said first and second arm means and contiguous to said pocket, for severing said standing tree, said propulsion means being used to drive said first arm means and said second arm means into said tree, the force of engagement causes said first and second links to pivot to said second position driving said cutter means into said tree and severing the tree at its base.

4,254,808

WEDGING APPARATUS USEFUL FOR LOG SPLITTING

Ronald W. Nokes, 8150 LaPlace Ct., Westminster, Colo. 80030

Filed Aug. 10, 1977, Ser. No. 823,490
Int. Cl.² B27L *7/00*
U.S. Cl. 144—193 C **6 Claims**

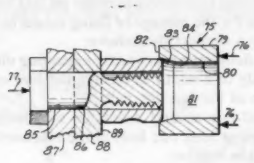


1. Apparatus for performing wedging type operations on severable material as in log splitting or the like comprising:
first and second elongated members, said first member having a hollow interior for receiving said second member within said first member and for accomodating coaxial relative movement between said members,
an elongated head having a base and a tapered body extending from said base to a tip, one of said elongated members being rigidly attached to said head base with the central axis of said attached member being generally normal to the plane of said head base, and
means selectably operable for securing said first and second elongated members against said coaxial relative movement therebetween, said securing means including a flexible band attached in surrounding relation to the outer surface of said outer member, said first member having at least one radial opening therethrough for allowing said band to be flexed for frictionally engaging the outer surface of said second member.

4,254,809
TWO-PIECE RIVET

Michael M. Schuster, Santa Monica, Calif., assignor to Hi Shear Corporation, Torrance, Calif.

Filed Sep. 11, 1978, Ser. No. 941,257
Int. Cl.[3] F16B *39/02, 35/00*
U.S. Cl. 411—167 14 Claims



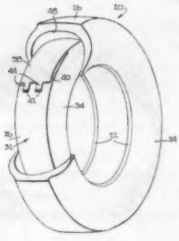
1. A two-piece rivet comprising: a shank member having an axis, and a head, a shank, and a thread in that order along the axis, said shank being cylindrical and having a shank, said thread being helical and having a substantially constant pitch, but having a major diameter which decreases as it extends away from a maximum adjacent to its end farthest from the shank, said maximum diameter being no greater than said shank diameter; and a ring-like collar to be swaged onto said thread, said collar having an inner wall and an outer wall, and a first and a second end, said inner wall defining a passage between said ends to receive with a substantial radial clearance at least a portion of said thread spaced from the end farthest from the shank, and with a larger diameter portion of the thread closer to said end and also received in said passage, whereby with said shank placed in an aperture in a workpiece, with at least a portion of the thread projecting beyond a surface of said workpiece, the collar may be placed over the thread, and with the shank restrained to prevent its being thrust back into the aperture, a swaging setting force having both axial and radial components can be exerted on the outer wall of the collar near its end farthest from the shank, whereby to force the other end of the collar against said surface of the workpiece, and to swage said inner wall adjacent to said first-mentioned end into the thread at its maximum diameter, and thereafter continuously moving said swaging force axially along the outer wall toward said surface to progressively and continuously swage the inner wall into engagement with the thread and maintain the axial force component against the workpiece thereby to exert through the thread a force on the shank member having an axial component directed away from said head.

4,254,810
NAIL-DEFLECTING, INNER-TUBE ASSEMBLY FOR RUN-FLAT TIRES

Daniel Shichman, Trumbull, Conn., assignor to Uniroyal, Inc., New York, N.Y.

Continuation of Ser. No. 741,918, Nov. 15, 1976, Pat. No. 4,164,250. This application Jan. 3, 1979, Ser. No. 847
The portion of the term of this patent subsequent to Aug. 14, 1996, has been disclaimed.
Int. Cl.[3] B60C *17/00*
U.S. Cl. 152—205 7 Claims

1. A pneumatic tire comprising a substantially toroidal-shaped carcass having a pair of bead-reinforced sidewall regions, a crown region annularly bridging said sidewall regions, and nail-deflecting means disposed internally of said carcass between said sidewall regions for deflecting a nail that punctures said crown region, said nail deflecting means including an annular inflatable inner tube capable of being inflated to a volume sufficient to engage with its exterior surface substantially the entire interior surface of said carcass and a puncture-proof, circumferentially expandible, but inextensible, pliable band disposed between said inner tube and said crown region, said band having overlapping opposite end portions with detent means on said end portions for maintaining the end portions of said band substantially immovable with respect to each other whereby said band is at a first predetermined circumferential magnitude encircling said tube in a first limit position with said tube being annularly spaced from the interior of said crown region when said tube is inflated to a predetermined inflation level and while said tire is puncture-free and has at least a first predetermined pressure level in the space between the carcass and the exterior of said inner tube, said first predetermined pressure level and said detent means cooperating with said band to maintain said inflated tube in said first limit

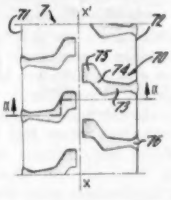


position, said detent means alone being insufficient to maintain said inflated tube in said first limit position, said detent means being releasable upon puncture of the crown region with consequent loss of pressure in said space below the first predetermined pressure to permit said inner tube to expand beyond said first limit position to a second limit position governed by the interior surface of said crown region with consequential movement of the end portions of said band with respect to each other to expand said band into a circumferential expanded condition wherein said band makes substantial circumferential contact with the interior of said crown region.

4,254,811
PNEUMATIC TIRES

Edmond-Yves Devaux, Clermont-Ferrand, France, assignor to Compagnie Generale des Etablissements Michelin, Clermont-Ferrand, France

Filed Jan. 19, 1978, Ser. No. 870,858
Claims priority, application France, Jan. 25, 1977, 77 02222
Int. Cl.[3] B60C *11/08*
U.S. Cl. 152—209 D 8 Claims



1. An off-the-road pneumatic tire comprising a radial carcass reinforcement and a tread reinforcement imparting to the tread a meridian curvature less than the circumferential curvature, characterized by the fact that:

the tread reinforcement is axially wider than the contact area of the tread with the ground;

the percentage of sculpting of the tread increases from the edges of the tread in the direction towards the equatorial zone of the tread, said percentage of sculpting of the tread taking into account the amount by which the

4,254,812
PNEUMATIC VEHICLE TIRE

Klaus-Dieter Röker, Garbsen; Wolfgang Pehl, Seelze, and Diethelm Reichenbach, Langenhagen, all of Fed. Rep. of Germany, assignors to Continental Gummi-Werke Aktiengesellschaft, Hanover, Fed. Rep. of Germany

Continuation of Ser. No. 868,290, Jan. 10, 1978, abandoned. This application Jul. 27, 1979, Ser. No. 61,426

Claims priority, application Fed. Rep. of Germany, Jan. 12, 1977, 2700965

Int. Cl.³ B60C *11/00*; C09K *3/14*

U.S. Cl. 152—211 **1 Claim**

1. A pneumatic vehicle tire comprising in combination a tread strip having wood powder particles embedded therein and finely distributed throughout to assure against skidding and sliding of the tread strip upon ice due to improvement in frictional coefficient on ice, said wood powder particles having a size in a range of from 0.12 to 0.16 mm., said wood powder particles constituting about 5% by weight of the tread strip mixture being directly compounded with the tread strip mixture in an amount ranging from 2% to 10% by weight of the mixture of which said tread strip is made.

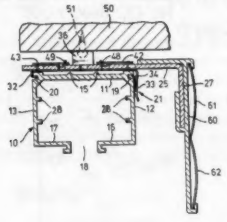
4,254,813
VALANCE BRACKET FOR VERTICAL VENETIAN BLIND

Francis Vecchiarelli, River Edge, N.J., assignor to Hunter Douglas International N.V., Netherlands Antilles

Filed Jun. 20, 1979, Ser. No. 50,305

Int. Cl.³ E06B *9/00*

U.S. Cl. 160—19 **10 Claims**



1. A device for mounting the headrail of a vertical Venetian blind and for holding a valance to the headrail, said headrail being of inverted channel cross-section having an upper web and downwardly extending front and rear flanges, said flanges being provided adjacent the web with elongate recesses extending the length of the headrail, said device comprising, in combination:

(i) a valance mounting bracket including a rearwardly extending arm having at least one hole therein;

(ii) a clip including:

(a) a clip body;

(b) a hook at one end of said body engageable in the elongate recess of the rear flange of the headrail;

(c) a leg at the other end of said body adapted to overlie the other flange of said headrail;

(d) a first detent on said leg engageable in the elongate recess of the other flange of the headrail to retain said clip on said headrail;

(e) at least one upstanding member on said body having an aperture for the passage of fixing means to hold said clip body to a support thereabove;

(f) means defining a rearwardly extending channel on said clip body of a width to receive the rearwardly extending arm of the bracket; and

(g) at least one second detent on said body engageable with said at least one hole in the rearwardly extending arm of the bracket.

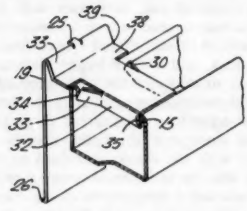
4,254,814
VENETIAN BLIND AND A VALANCE BRACKET THEREFOR

Francis Vecchiarelli, River Edge, N.J., assignor to Hunter Douglas International N.V., Netherlands Antilles

Filed Jun. 20, 1979, Ser. No. 50,315

Int. Cl.³ E06B *9/00*

U.S. Cl. 160—19 **10 Claims**



1. A valance bracket for a horizontal venetian blind having a generally channel cross-section headrail, with a lower web and front and rear walls each terminating in an upper rim, whereby the rims have a gap therebetween, said bracket comprising, as a unitary structure formed in one single piece, a main body dimensioned to bridge the gap between said rims, an end portion at one end of said body adapted to overlie one of said rims, at least one tongue cantilevered from said body at a location spaced from said one end, said tongue being located below said body and extending away from said body at an acute angle thereto, and being resiliently engageable on said one rim, an abutment member extending downwardly from said body at a location spaced from said one end and having an abutment surface on the side remote from said one end which is inclined downwardly away from said one end, to lockingly engage said other rim and be urged thereagainst by the resilient interaction between said one rim and said at least one tongue, and a valance support member connected to said main body to depend in front of said headrail when said bracket is mounted thereon.

4,254,815
CURTAIN SUPPORTING AND POSITIONING COMBINATION

Paul E. Comeau, Warwick, R.I., assignor to Kenney Manufacturing Company, Warwick, R.I.

Filed Mar. 23, 1979, Ser. No. 23,071

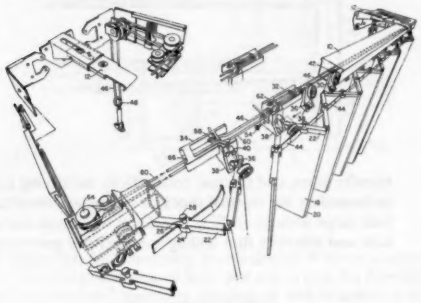
Int. Cl.³ A47H *1/00*

U.S. Cl. 160—126 **8 Claims**

1. A traverse rod and curtain support combination comprising:

a pair of master carriers for transporting the mating margins of a pair of curtain components between an opened and a closed position;

a pull cord in the form of a loop mounted longitudinally of said rod with one strand of the loop attached to one said master carrier and the other strand attached to the other master carrier, whereby pulling one strand of the loop pulls the masters apart to the opened position and pulling the other strand pulls the masters in the opposite direction to the closed position at a point near the center of said rod but separated therefrom by a predetermined specific dimension,



means at one said master carrier for providing a limited dimension of lost motion between said draw cord and the master, said dimension of lost motion being equal to said predetermined specific dimension to one side of the centerline of the curtain at which the masters are intended to meet in the closed position

whereby when one master arrives at the opened or closed position before the other master has reached its corresponding position, said cord can be pulled additionally to bring the other master to its corresponding position.

4,254,816

APPARATUS FOR MANUFACTURING MOLD PARTS

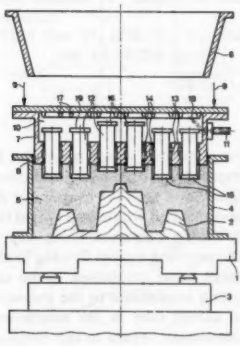
Werner Geiger, Meggen, Switzerland, assignor to Inventio AG, Hergiswil, Switzerland

Filed Sep. 17, 1979, Ser. No. 76,255

Claims priority, application Switzerland, Oct. 5, 1978, 10340/78

Int. Cl.³ B22C *15/08*

U.S. Cl. 164—173 **8 Claims**



1. An apparatus for manufacturing boxless casting mold parts, comprising:

a match plate support for carrying a pattern;

a molding box disposed upon said match plate support and serving for the reception of molding sand from a sand filling device;

a compaction device moveable to a work position between said sand-filling device and said molding box;

said compaction device being provided with a hollow chamber;

means for infeeding a pressurized fluid medium to said hollow chamber;

a plurality of displacable press punches serving for post-compaction of the sand in said mold box and protruding into said hollow chamber;

said compaction device comprising a compaction plate receivable within said molding box for pre-compaction of the sand; and

said compaction plate being provided with recess means for receiving and arranging said press punches at a spacing from one another such that following compaction of the sand there is formed a coherent ejection and contact surface which is interrupted by recesses.

4,254,817

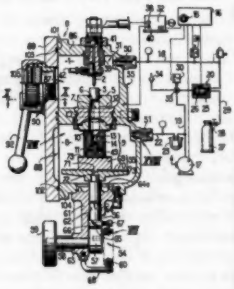
METAL CASTING APPARATUS

Yoshimasa Kidowaki, Osaka, and Shiro Okamoto, Shigaken, both of Japan, assignors to Iwatani Sangyo Kabushiki Kaisha, Osaka, Japan

Filed May 30, 1979, Ser. No. 43,613

Int. Cl.³ B22D *18/00, 18/06, 27/02*

U.S. Cl. 164—252 **20 Claims**



1. A metal casting apparatus, including:

a casting furnace including an upper, first chamber, and a lower, second chamber positioned beneath said first chamber, said first and said second chambers being divided by generally horizontal separating wall means;

means forming a vertically extending liquid passageway through said separating wall means between said first chamber and said second chamber;

a crucible made of electrically conductive material received within said first chamber and supported on said separating wall means, said crucible having a recess therein for receiving a body of casting metal and supporting the lower end thereof, and an opening therethrough extending from the bottom of said recess downwardly to the bottom surface of said crucible, said crucible opening being smaller in diameter than the lower end of said body of casting metal and being dimensioned such that when said body of casting metal has been completely melted and placed in a molten state it will flow freely therethrough by gravity without the employment of any additional flow causing means;

said crucible being placed on said separating wall means with said crucible opening in communication with said liquid passageway, and said crucible having open gas passage means therein leading from the outer diameter thereof to a location on the surface of said crucible opening beneath said crucible recess to thereby freely communicate said first chamber with both said crucible opening and said liquid passageway;

mold means received within said second chamber, and including a mold cavity having an inlet;

means supporting said mold means within said second chamber, with said mold inlet in communication with said passageway;

electrode means mounted within said first chamber on the ceiling thereof above said crucible, said electrode means being vertically adjustable for adjusting the gap between said electrode means and the upper end of a body of casting metal received in said crucible recess; and

power supply means connected with said electrode means;

said electrode means and said power supply means being connected and arranged to establish an electric arc between said electrode means and the upper end of a body of casting metal received in said crucible recess, effective to melt said body of casting metal downwardly from the top to the bottom thereof, the lower end of said body of casting metal serving to block liquid flow through said crucible opening until all of said body of casting metal has been placed in a molten state by said electric arc.

4,254,818

METHOD AND MEANS FOR THE COOLING OF HEAT GENERATING INDUSTRIAL OPERATIONS

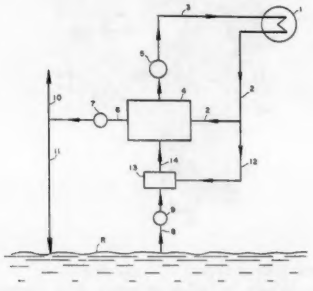
Avraham Melamed, 31 Oranim St., Kfar Shemaryahu, Israel

Filed Jul. 11, 1979, Ser. No. 56,656

Claims priority, application Israel, Aug. 21, 1978, 55402

Int. Cl.³ F28F *19/00, 23/00*

U.S. Cl. 165—1 **8 Claims**



1. A method of cooling a heat generating industrial operation comprising establishing in said operation a cooling system of a metal or alloy corrodible by water and dilute aqueous saline solutions, further establishing a cooling pond holding a body of an aqueous saline solution of a concentration of 20 to 35% by weight and flowing brine in closed circuit between said pond and cooling system.

4,254,819

PROTECTING ENTRY PORTIONS OF TUBES OF EMERGENCY COOLING SYSTEM

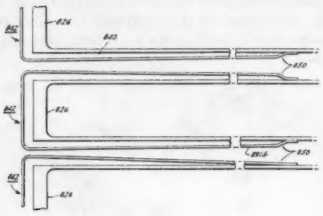
G. Richard Worrell, Media, Pa., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Filed Oct. 12, 1979, Ser. No. 84,230

Int. Cl.³ F28F *13/14*

U.S. Cl. 165—1 **9 Claims**

2. In an emergency cooling system for cooling an emergency unscheduled large heat surge in a flowing stream of fluid, said emergency cooling system comprising a vat, a quiescent heat transfer liquid in said vat, on array of generally parallet generally horizontal heat transfer tubes immersed at a significant depth in said quiescent heat transfer liquid, whereby there is the potentiality of a heat surge heating the quiescent liquid to the boiling point and a portion of said liquid is boiled away above the array of tubes, the improvement which consists of: associating thermal conductivity modifying means with an initial 2 feet to 8 feet portion of substantially each of said heat transfer tubes, whereby such modified portion of a tube has a thermal conductivity which is within a range from about 0.05 to about 1.6 BTU/hr/sq ft/°F./ft, whereby carbon steel may be employed for said heat



transfer tubes, said thermal conductivity modifying means withstanding the thermal shock of said unscheduled large heat surge without spalling, cracking, or related malfunction, and whereby film boiling is effectively prevented.

4,254,820

HEAT TRANSPORT DEVICE

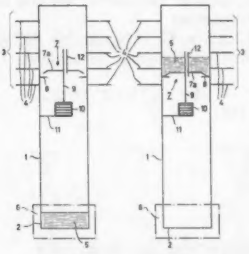
George A. A. Asselman, Eindhoven, Netherlands; Johann Schröder, Aachen, Fed. Rep. of Germany, and Faramarz Mahdjuri, Bergamo, Italy, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 3, 1978, Ser. No. 957,396

Claims priority, application Fed. Rep. of Germany, Dec. 2, 1977, 2753660

Int. Cl.³ F28D *15/00*

U.S. Cl. 165—39 **3 Claims**

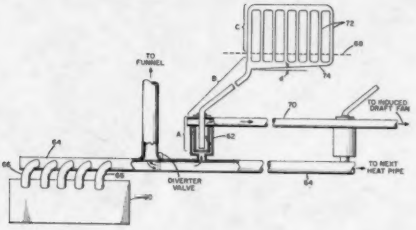


1. Heat transport apparatus, which comprises a closed tube having an evaporator and a condenser, said condenser being positioned at a higher level than the evaporator during operation, a heat transport medium within said closed tube, said heat transport medium during operation being vaporized in the evaporator with the resulting vapors flowing to the condenser and with said vapors being condensed in the condenser for return of the resulting condensate to the evaporator, a valve positioned in said closed tube in the condenser region for interrupting the condensate return to the evaporator, a pressure-expansion chamber arranged within the closed tube and subject to the vapor pressure of the heat transport medium, said pressure-expansion chamber being connected to the valve and closing the valve when the vapor pressure in the condenser exceeds a given value, and a pressure-equalization duct forming part of said valve and providing communication between the evaporator and the condenser.

4,254,821
HEAT PIPE DEICING APPARATUS

Seigo Matsuda, Wayland; Gabor Miskolczy, Carlisle, and John B. Dunlay, Wayland, all of Mass., assignors to Thermo Electron Corporation, Waltham, Mass.

Filed Aug. 10, 1979, Ser. No. 65,493
Int. Cl.³ F28D *15/00*
U.S. Cl. 165—41 **6 Claims**



1. Apparatus for preventing accumulation of ice on a structure comprising: a source of heat; and a heat pipe for transferring heat from said source to portions of said structure to be deiced, said heat pipe having a heat transfer fluid sealed therein and comprising:

an evaporator in contact with said source of heat for vaporizing said heat transfer fluid;

at least one condenser positioned above said evaporator and attachable to portions of said structure to be deiced, said condenser operable to condense said heat transfer fluid and to transfer heat to said portions to be deiced; and

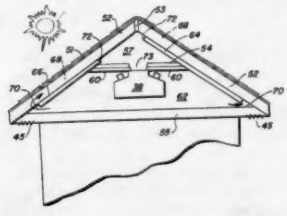
insulated transition means connecting said evaporator and said condenser for transporting vaporized heat transfer fluid to said condenser and condensed heat transfer fluid to said evaporator;

said transition means and said condenser including a plurality of legs each providing a separate passageway between said condenser and said evaporator, said passageways assuring adequate gravity-assisted transport of said condensed fluid to said evaporator during operation of said apparatus at different angular orientations.

4,254,822
BUILDING HEATING SYSTEM, PARTICULARLY UTILIZING SOLAR AND WASTE HEAT RECOVERY

Julius D. Geier, Decatur, Ill., assignor to Illinois Power Company, Decatur, Ill.

Filed Nov. 27, 1978, Ser. No. 963,790
Int. Cl.³ F25B *29/00*
U.S. Cl. 165—48 S **6 Claims**



4. In a central, forced-air building heat system which includes a plenum system for distributing heated air from a furnace in a warm air plenum, and for returning cold air to the furnace in a cold air plenum, the improvement comprising:

heat pump means comprising heat rejecter means positioned to directly communicate with said cold air plenum, said heat rejecter means being located upstream of and in series with said furnace, said heat pump means also including heat exchanger means positioned adjacent the roof of said building, said roof defining rafters and partition means to define parallel, enclosed flow channels between said rafters, and means to pump air through said flow channels and then across said heat exhanger means, in which said building roof defines a generally sunward side and a shady side, said partition means defining said flow channels on the shady side of said roof being longer than the partition means defining said flow channels on the generally sunward side of said roof, whereby greater air passes through the flow channels under the generally sunward side of the roof than through the flow channels of the generally shady side of the roof.

4,254,823
PROCESS FOR SEPARATING MINERAL WOOL FIBERS FROM NONFIBROUS MATERIALS

Nils G. Cederqvist, Lerdala; Karl M. E. Hellsten, Odsmal; Kerstin E. Henriksson, Kode, and Lars A. S. Waag, Stenungsund, all of Sweden, assignors to Berol Kemi AB, Stenungsund, Sweden

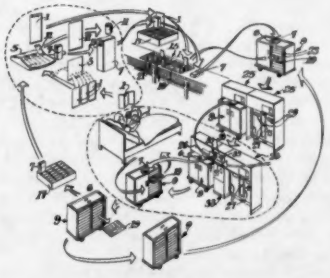
Continuation-in-part of Ser. No. 658,137, Feb. 13, 1976, abandoned. This application Apr. 27, 1977, Ser. No. 791,456
Claims priority, application Sweden, Feb. 13, 1975, 7501637
Int. Cl.³ D21B *1/00*
U.S. Cl. 165—55 **17 Claims**

1. A process for removing substantially all nonfibrous material from mineral wool fibrous material, which comprises dispersing an amount within the range from about 0.1 to about 4% mineral wool material comprising from about 20 to about 40% by weight nonfibrous material and the remainder mineral wool fibrous material in an aqueous solution of a cationic surfactant having at least one hydrophobic group containing at least eight carbon atoms and at least one cationic hydrophilic group having at least one nitrogen atom or one sulphur atom, thereby forming a suspension of the fibrous material substantially free from nonfibrous material that is sufficiently stable to permit separation of the nonfibrous material therefrom; separating the nondispersed nonfibrous mineral wool material from the dispersed fibrous material; and then recovering the mineral wool fibrous material substantially free from nonfibrous material from the surfactant solution.

4,254,824
FOOD PREPARATION APPARATUS

Donald A. Springer, North Ridge, Calif., assignor to Anchor Hocking Corporation, Lancaster, Ohio

Continuation-in-part of Ser. No. 758,455, Jan. 11, 1977, abandoned. This application Feb. 21, 1979, Ser. No. 13,789
Int. Cl.³ F25B *29/00*
U.S. Cl. 165—64 **5 Claims**



1. Apparatus for preparing cooked or heated meals compris-

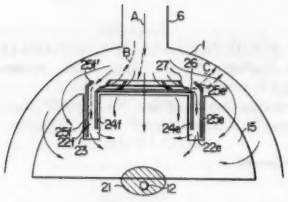
ing a food and beverage cabinet having access doors, heater shelves in the cabinet which support food trays, each shelf including a frame, an inner filler layer, a lower layer, and a top layer supporting raised heater elements, said elements being insulated from the top layer and having directly bonded beneath and to the raised element a resistive etched film heater means laminated between two dielectric layers, said film heater means being bonded to said element and to said top layer by silicone rubber to comprise the sole means for securing said film heater means to said heater element, silicone rubber further completely surrounding its heater element and being disposed between its heater element and said film heater means to insulate said heater element from and raise it above the remainder of said top layer, electrical leads attached to said etched film heater means for heating the raised heater elements, said leads routed between the top layer and the inner filler layer through wireways to a common printed circuit electrical connector, means connected with said heater shelf rack for supplying current to said electrical leads, means connected with said resistive etched film heater means for automatically controlling the temperature of said heater elements, air outlet means in the back panel of said cabinet, a plenum chamber for said cabinet, air outlet means in the front panel of said chamber, air inlet means in the said front panel of said chamber, means for coupling the chamber to said food and beverage cabinet so that the back panel of said cabinet is integral with the front panel of the chamber in sealed relationship therewith, said outlet means of the chamber being in flow communication with said cabinet and said outlet means of the cabinet mating with said inlet means of the chamber when the cabinet and the chamber are coupled, and means for flow communicating said outlet and inlet means of the cabinet and said chamber when the cabinet and chamber are coupled whereby chilled air is continuously circulated through the coupled cabinet and said chamber in a closed loop pattern.

4,254,825

MULTITUBULAR HEAT EXCHANGER

Syuichi Imazu, Hitachi, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Oct. 3, 1979, Ser. No. 81,358
Claims priority, application Japan, Oct. 5, 1978, 53-121967
Int. Cl.[3] F28B 9/10; F28F 9/22
U.S. Cl. 165—114 **10 Claims**



1. In a multitubular heat exchanger comprising a shell, a heating medium inlet formed in said shell, a high temperature tube bundle and a low temperature tube bundle located within said shell and formed by a large number of U-shaped heat transfer tubes for permitting a medium to be heated to flow therethrough so that heat exchange may take place between the medium to be heated and a heating medium introduced into the interior of said shell through said heating medium inlet, and a vent tube interposed between said high temperature tube bundle and said low temperature tube bundle arranged in the longitudinal direction of said shell for removing noncondensable gas therethrough from the interior of the shell, wherein the improvement comprises:

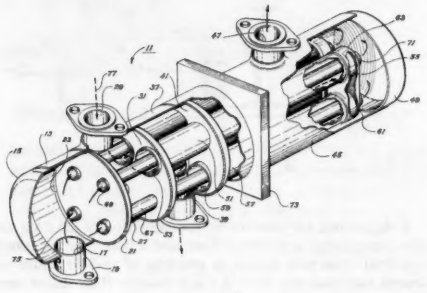
means for defining at least one laterally-closed flow passage in at least one of said tube bundles, said flow passage inducing therethrough part of the heating medium flowing between said shell and said tube bundles to an inner deep portion of said at least one tube bundle.

4,254,826

MODULAR HEAT EXCHANGER

Charles L. Adams, Fort Worth, Tex., assignor to PVI Industries Inc., Fort Worth, Tex.

Filed Sep. 11, 1979, Ser. No. 74,554
Int. Cl.[3] F28F 9/26; F28D 7/10
U.S. Cl. 165—143 **10 Claims**



1. An apparatus for exchanging heat between two fluids, comprising in combination:

a first cup-shaped module having a first port for the passage of a first fluid, the first module having an inner end containing two inner tube holes;

a second cup-shaped module with a rim on its outer end that sealingly receives the inner end of the first module, the second module having a second port on its side wall for the passage of a second fluid, and an inner end that has an inner tube hole and an outer tube hole;

a third cup-shaped module with a rim on its outer end that sealingly receives the inner end of the second module, the third module having a third port on its side wall for the passage of the second fluid, and an inner end that has two outer tube holes;

a fourth cup-shaped module with a rim on one end that sealingly receives the inner end of the third module, the other end of the fourth module being closed, the fourth module having a fourth port on each side wall for the passage of the first fluid;

a long outer tube having a first end sealingly secured to the outer tube hole in the second module, extending sealingly through one of the outer tube holes in the third module, and a second end terminating adjacent the closed end of the fourth module;

a short outer tube having a first end sealingly secured to the other outer tube hole in the third module, and a second end terminating adjacent the second end of the long outer tube;

a crossover manifold communicating the second ends of the outer tubes, to cause second fluid flowing from the first end to the second end of one outer tube to enter and flow from the second end to the first end of the other outer tube, the crossover manifold having two inner tube holes; and

two inner tubes, each carried concentrically in one of the outer tubes, each having a first end sealingly secured to one of the inner tube holes in the first module, each having a second end sealingly secured to one of the inner tube holes in the crossover manifold, one of the inner tubes sealingly passing through the inner tube hole in the second module, the first fluid moving through the inner tubes between the first and fourth ports, exchanging heat with the second fluid as it moves through the outer tubes between the second and third ports.

4,254,827

END CLOSURE ARRANGEMENT FOR HEAT EXCHANGER ELEMENT

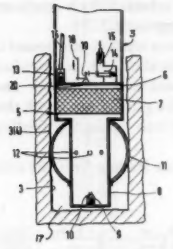
Siegfried Förster, Ottenfeld, and Manfred Kleemann, Quadrath, both of Fed. Rep. of Germany, assignors to Kernforschungsanlage Jülich Gesellschaft mit beschränkter Haftung, Jülich, Fed. Rep. of Germany

Continuation of Ser. No. 724,727, Sep. 20, 1976, abandoned, which is a continuation of Ser. No. 572,643, Apr. 29, 1975, abandoned. This application Jun. 12, 1978, Ser. No. 914,187

Claims priority, application Fed. Rep. of Germany, Apr. 30, 1974, 2420920

Int. Cl.[2] F28F *3/00*

U.S. Cl. 165—166 **4 Claims**



1. A counterflow heat exchanger having a member which is exposed to individual mediums on opposite sides at high pressure and high temperature, said member having opposite ends and comprising in combination a series of folded portions of U-shaped in cross section thin-walled metallic material between said ends forming separation extending across the member from one of said ends to the opposite end, thereby forming chambers having flow of mediums therethrough, and at least one closure band having a thickness substantially greater than that of said member and approximately half of the spacing between folded portions and also of metallic material and having a meandering shape of the folded portions in conformity with the configuration of said member near a said end thereof and sealingly bonded to one surface of the member at said end, the adjacent convolutions of said band being spaced less than the thickness of said band and bonded together by welding to close the spaces between adjacent convolutions, so as to seal one end of a chamber on one side of said member.

4,254,828

APPARATUS FOR PRODUCING FRACTURES AND GAPS IN GEOLOGICAL FORMATIONS FOR UTILIZING THE HEAT OF THE EARTH

Armin Sowa, Ottobrunn, and German Munding, Bad Friedrichshall, both of Fed. Rep. of Germany, assignors to Messerschmitt-Bölkow-Blohm GmbH, Fed. Rep. of Germany

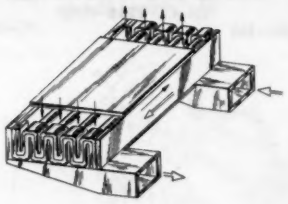
Filed Dec. 8, 1978, Ser. No. 967,839

Claims priority, application Fed. Rep. of Germany, Dec. 21, 1977, 2756934

Int. Cl.[3] E21B *43/26*

U.S. Cl. 166—63 **3 Claims**

1. An apparatus for producing large surface fractures and gaps in rock structures, comprising a bore pipe extending downwardly into the crystalline rock structure, a catalyst housing connected to the lower end of said bore pipe having a catalyst therein, a monergolic gas supply line leading into said catalyst housing, injection valve means between said supply line and said housing permitting the entrance of the gas under pressure and the sealing of the pipe line between the bore wall and the catalyst housing and a discharge valve mounted on said housing having an opening into the bore at the crystalline rock



structure and being openable under pressure to permit discharge of the gases into the bore to increase the gap area.

4,254,829

WELL LOCKING DEVICE

Fred E. Watkins, Houston, Tex., assignor to Camco, Incorporated, Houston, Tex.

Filed Sep. 24, 1979, Ser. No. 78,112

Int. Cl.[3] E21B *23/02*

U.S. Cl. 166—134 **4 Claims**

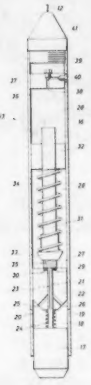
1. In a well lock for locking in the bore of a tubing in a well, said tubing including first and second recesses and a stop shoulder, said lock including a lock housing carrying first and second locking means, seal means positioned on the exterior of the housing and adapted to seal with the bore of the tubing, locator means on the housing having a shoulder for engaging said stop shoulder, a mandrel positioned for telescoping movement in the housing, means on the mandrel for locking the first locking means in the first recess on longitudinal movement of the mandrel, means on the mandrel for engaging said second locking means for preventing unlocking of the first locking means if pressure is applied to the seal to move the housing upwardly, and releasable locking means between the mandrel and the housing, the improvement comprising,

the distance between the bottom of the first locking means and the locator shoulder being less than the distance between the bottom of the first recess and the stop shoulder on the tubing.

4,254,830
GEOTHERMAL WELL SAMPLER APPARATUS

Tom A. Garney, and Raymond E. Roesner, both of Houston, Tex., assignors to Dresser Industries, Inc., Dallas, Tex.

Filed Sep. 10, 1979, Ser. No. 74,351
Int. Cl.[3] E21B 49/08
U.S. Cl. 166—162 6 Claims



1. An apparatus for collecting a sample of the fluid contents in a higher temperature borehole, at a predetermined location within said borehole, comprising:

an elongated body member adapted to traverse said borehole;

a sample retention chamber within said body member;

sealing means for isolating said chamber from said borehole contents; and

adjustable means for establishing the sealing force of said sealing means, said sealing force being

established so that said sealing force will be overcome at a predetermined location within said borehole, thereby placing said chamber in fluid communication with said borehole.

4,254,831
METHOD AND APPARATUS FOR RESTORING AND MAINTAINING UNDERGROUND AQUIFER WATER SYSTEM

Carl E. Nuzman, Silver Lake, Kans., assignor to Layne-Western Company, Inc., Mission, Kans.

Filed Dec. 27, 1979, Ser. No. 107,566
Int. Cl.[3] E21B 43/27, 43/30
U.S. Cl. 166—245 20 Claims

1. A method of restoring and/or maintaining an underground aquifer water supply plagued with plugging problems and provided with at least one production well extending downwardly into the aquifer and normally operated on a continuous water delivery basis, the steps of:

drilling a plurality of injection wells in the ground in spaced relationship from one another and said production well in substantially surrounding relationship to the latter and also extending downwardly in the ground to a depth that liquid delivered thereto will flow into the aquifer feeding said production well;

providing water recycle flow routes from a water discharge section of the production well to said injection wells;

introducing a treatment additive into the water recycle flow routes which is capable of altering the nature of naturally occurring flow impeding agents in the aquifer to an extent to decrease the plugging characteristics thereof, and

said drilling step further including locating such injection wells in predetermined, relative dispositions causing the additive containing water delivered to the injection wells to flow toward the production well in respective patterns which initially increase in area from corresponding injection sites and then decrease as the production well is approached by virtue of the effect thereon of the flow of water in the aquifer toward the production well;

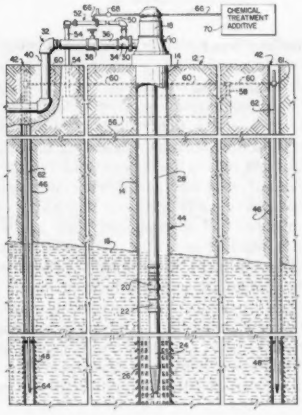
bypassing a predetermined ratio of water discharged from the well and recycling the same back into the aquifer via said injection wells,

said bypass and recycling being carried out on a sustantially continuous basis during delivery of water from the production well.

16. In a system for restoring and/or maintaining an underground aquifer plagued with plugging problems and used to supply water to a point of use wherein at least one production well extends downwardly onto the aquifer and water is removed therefrom on substantially a continuous delivery basis, the improvement comprising:

a plurality of injection wells in the ground in spaced relationship from one another and said production well in surrounding relationship to the latter and also extending downwardly in the ground to a depth that liquid delivered thereto will flow into the aquifer feeding said production well;

a water discharge line leading from the outlet of the production well;



a water bypass and recycle line including segments from the discharge line to the inlet of each of the injection wells,

structure for introducing a treatment additive into the water flowing through said bypass and recycle line segments from the production well to the injection wells,

said additive being capable of altering the nature of naturally occurring flow impeding agents in the aquifer to an extent to decrease the plugging characteristics thereof, and

the injection wells being located in predetermined, relative dispositions such that the additive containing water delivered to the injection wells flows toward the production well in respective patterns which initially increase in area from corresponding injection sites and then decrease as the production well is approached by virtue of the effect thereon of the flow of water in the aquifer toward the production well;

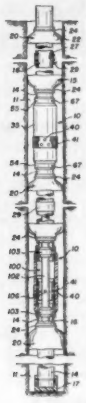
means operably associated with said bypass and recycle line segments for controlling the flow of liquid therethrough permitting selective variation of the amount of additive containing water which is returned to the injection wells for delivery back into the aquifer, as a proportion of the water delivered from the production well on a substantially continuous basis.

4,254,832

SAMPLER AND MEASUREMENT APPARATUS

Franklin D. Patton, and James D. McFarlane, both of West Vancouver, Canada, assignors to Westbay Instruments Ltd., West Vancouver, Canada

Filed Nov. 13, 1978, Ser. No. 960,011
Int. Cl.[3] E21B 33/124
U.S. Cl. 166—332 6 Claims



1. Sampler and measurement apparatus for use with casings having a predetermined inner diameter and axially aligned therewith when in use to form a common passageway through which can be moved instruments for taking samples and/or measurements, and operating tools, said apparatus comprising

a coupler in the form of a tubular body having opposite open ends having annular inner surfaces and into which ends of axially aligned tubular casings can fit, said body having an inner bore of a diameter greater than said casing inner diameter and on a common axis with the casings,

connecting and sealing means at the ends of the tubular body for connecting and sealing said ends to the aligned casings, at which time the bore of said body forms a common passageway with the casings through which instruments and operating tools can be moved,

said connecting and sealing means at each of said ends of the tubular body comprising a first annular groove in the annular inner surface of tubular body, a sealing ring in the annular groove to receive and tightly fit around a casing end, a second annular groove in the annular inner surface of the tubular body spaced outwardly in an axial direction from the first groove, and a flexible shear fastener in said second groove adjusted to fit in an overlying groove in said casing end to lock said casing and the tubular body together,

port means in the body spaced from the ends thereof,

a closure sleeve slidably fitted in the bore of the tubular body and movable longitudinally thereof, said sleeve having an inner effective diameter the same as the casing inner diameter, said sleeve being movable by a tool moved through the passageway to cover and uncover the port,

a first stop in the bore of the body near an end thereof and so spaced in one axial direction away from the port means that when the sleeve engages said first stop, the port means is covered, and

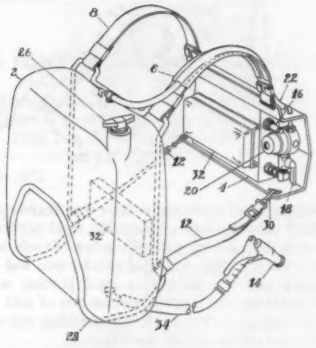
a second stop in the bore of the body near an opposite end thereof and so spaced in the opposite axial direction away from the port means that when the sleeve engages said second stop, the port means is uncovered.

4,254,833

PORTABLE FIRE EXTINGUISHER WITH LIQUID AND PRESSURE GAS TANKS

George Perry, 4800 Cullen Rd., Rte. #3, Fenton, Mich. 48430

Filed Aug. 31, 1978, Ser. No. 938,443
Int. Cl.[3] A62C 13/38
U.S. Cl. 169—76 2 Claims



1. A portable fire extinguisher comprising:

a tank of compressible fluid under pressure;

a filler valve for allowing pressurized fluid to be introduced into said tank;

a shut off valve for controlling the dishcarge of fluid from said tank;

a liquid carrying tank with a pressure sealing filler cap at the top, a liquid discharge fitting at the bottom, and a pressurized fluid inlet fitting at the top of said liquid carrying tank;

a bent wire support bracket bent in a form for carrying said liquid carrying tank;

a pair of shoulder carrying straps with one end attached to the top of said compressible fluid tank and the other attached to the top of said bent wire support bracket;

at least one shoulder strap including a pocket with open ends extending along the length thereof;

a flexible conduit connected between said shut off valve and said pressurized fluid inlet fitting;

said flexible conduit secured within said pocket as it passes over the user's shoulder wherein entanglement and damage to the conduit is prevented;

an operator adjustable pressure regulator disposed in said conduit;

a trigger actuated spray nozzle, said spray nozzle attached to said liquid discharge fitting by means of a flexible liquid carrying hose; and

a pair of adjustable stabilizing straps attached at one end to the lower inside corners of said compressible fluid tank and at the other end to the lower inside corners of said support bracket.

4,254,834

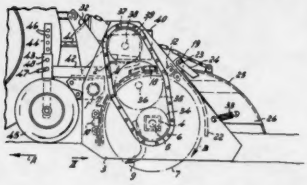
SOIL WORKING MACHINE

Ary van der Lely, Maasland, and Cornelis J. G. Bom, Rozenburg, both of Netherlands, assignors to C. van der Lely N.V., Maasland, Netherlands

Filed Aug. 28, 1978, Ser. No. 937,471
Claims priority, application Netherlands, Sep. 1, 1977, 7709622; Jul. 17, 1978, 7807622
Int. Cl.[3] A01B 33/02
U.S. Cl. 172—112 18 Claims

1. A soil working machine comprising a frame and a plurality of soil working means, mounted on said frame for rotation about a substantially horizontal transverse axis, a hood member positioned above and adjacent said soil working means and

extending throughout the working width of said machine, said soil working means comprising a plurality of laterally spaced apart groups of tools, driving means connected to rotate said tools to move worked soil through a path defined at least in part by said hood member, said hood member comprising a plurality of separate rigid and flexible sheet portions positioned across the width of the hood member, neighboring rigid portions being spaced apart and at least one flexible portion being positioned between said neighboring rigid portions generally in line with the working path of a group of tools, said rigid and flexible portions being arranged side-by-side and means interconnecting opposite sides of a rigid portion with adjacent flexible portions, the relative movements of said flexible portions preventing worked earth from sticking and accumulating on said hood means during operation.

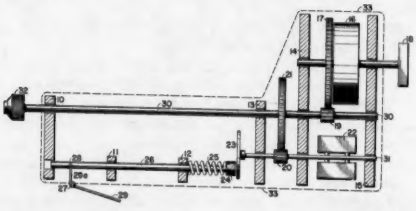


4,254,835

SPRING POWERED ROTARY TOOL

Fred Lichtgarn, 314 Evonshire St., Santa Barbara, Calif. 93111

Filed Oct. 2, 1978, Ser. No. 947,424
Int. Cl.³ E21B *3/00, 7/22*
U.S. Cl. 173—163 **5 Claims**



1. A spring-powered rotary motion tool comprising:
(a) a housing;
(b) spring-powered rotation means in said housing for providing rotary power;
(c) a gear train driven by said rotation means for progressively stepping-up the speed from said rotation means;
(d) rotation control means cooperatively connected to said gear train for selectively braking same;
(e) a manually operated lever pivotally mounted to said housing and connected to said rotation control means for controlling the same;
(f) a chuck connected to the end of said gear train.

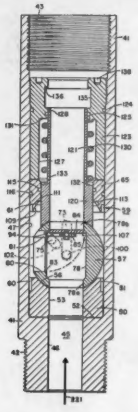
4,254,836

METHODS AND APPARATUS FOR CONTROLLING FLUID FLOW

Larry R. Russell, 6420 Hillcroft, Houston, Tex. 77081

Division of Ser. No. 895,157, Apr. 10, 1978. This application Jul. 25, 1979, Ser. No. 60,575
Int. Cl.³ E21B *41/00*
U.S. Cl. 175—65 **25 Claims**

1. Method for control of fluid flow through a conduit, comprising providing a pilot valve in the conduit which is normally closed when no fluid is flowing through the conduit and which is closed when fluid is flowing through the conduit in one direction and which is moved to open when fluid is flowing through the conduit in the opposite direction, providing a main valve having a straight open fluid flow passage therethrough in the conduit which is normally open when no fluid is flowing through the conduit and which is open when fluid is flowing through the conduit in said opposite direction and which is moved to close by a fluid pressure gradient in the conduit in said one direction when said pilot valve is closed, opening said pilot valve by flowing fluid through the conduit in said opposite direction with said main valve remaining open during such flow, and closing said pilot valve and said main valve by flowing fluid through the conduit in said one direction, said pilot valve when open having an open flow passage therethrough in line with said fluid flow passage through said main valve.

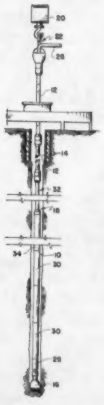


4,254,837

TECHNIQUE FOR DAMPING OSCILLATIONS IN A DRILL STRING

Kenneth R. Jones, Corpus Christi, Tex., assignor to Mustang Tripsaver Inc., Corpus Christi, Tex.

Continuation of Ser. No. 849,718, Nov. 8, 1977, abandoned. This application Apr. 12, 1979, Ser. No. 29,524
Int. Cl.³ E21B *17/00*
U.S. Cl. 175—67 **21 Claims**



1. A shock sub for connection in a drill string, comprising:

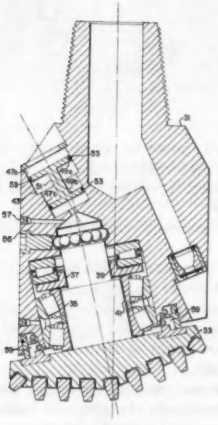
a barrel having means at one end for connection to the drill string;
a mandrel mounted in the barrel for telescoping movement along a longitudinal axis, having means at one end for connection to the drill string, and defining with the barrel a spring receiving chamber;
means for transmitting torque between the barrel and mandrel;
a ring spring assembly in the chamber for damping relative movement of the mandrel and barrel, the assembly comprising:
a multiplicity of inner and outer annular ring springs residing in planes transverse to the axis,
the inner ring springs comprising radially outer surfaces inclined to the axis,
the outer ring springs comprising radially inner surfaces inclined to the axis and engaging the radially outer surfaces of the inner ring springs,
the assembly exhibiting a substantially constant spring rate of less than 25,000 pounds per inch of deflection and a load capacity of between 10,000–125,000 pounds;
means carried by the mandrel and the barrel for expanding the outer ring springs and compressing the inner ring springs upon collapsing movement of the barrel and mandrel;
a liquid lubricant in the chamber; and
means sealing the chamber throughout the range of telescoping movement of the barrel and mandrel.

4,254,838

AUTOMATIC DEPTH COMPENSATING DEVICE

Eduardo Barnetche, Ave. Universidad Num. 482., Mexico 13, D. F., Mexico

Filed Jul. 24, 1979, Ser. No. 60,056
Int. Cl.³ E21B *10/22*
U.S. Cl. 175—228 **12 Claims**



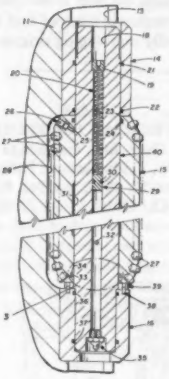
1. An automatic depth compensating device for controlling the pressure in a first volume in response to pressure changes in an environment adjacent to said first volume said device comprising:
(a) a cylinder, said cylinder including a first bore having a first cross-sectional area and a second bore having a second cross-sectional area, said first and second bores being axially aligned;
(b) first piston means having a first surface area, said first piston means being slidably positioned in said first bore;
(c) second piston means having a second surface area, said second piston means being slidably positioned in said second bore, wherein said first and second surface areas are different and a second volume is formed between said first and second piston means; and
(c) coupling means for rigidly coupling said first and second piston means such that said first and second piston means move together wherein said coupling means is positioned in said second volume and the portion of said second volume occupied by said coupling means is negligible relative to said second volume.

4,254,839

RADIAL FORCE ANTI-EXTRUSION DEVICE FOR SEALED DRILL STRING UNIT

Ricky K. Schpok, Dallas, and Leo A. Martini, Mesquite, both of Tex., assignors to Dresser Industries, Inc., Dallas, Tex.

Filed Jun. 21, 1979, Ser. No. 50,727
Int. Cl.³ E21B *10/22*
U.S. Cl. 175—372 **3 Claims**



1. An improved seal assembly for an earth boring tool having a tool body with a bearing shaft and a roller member mounted for rotation about said bearing shaft, said earth boring tool to be operated in a fluid drilling environment and lubricant to be maintained between said bearing shaft and said roller member, an annular seal gland in said roller member having an inner side exposed to said lubricant and an outer side exposed to said fluid drilling environment, the improvement comprising:
an annular elastomer seal member positioned in said seal gland and extending around said bearing shaft, said member sized to fit within said gland and defining an inner surface projecting from said gland into sealing engagement with said shaft and an outer surface facing said outer surface of said gland, an annular axially elongated cavity in said member opening to said outer surface and,
a resilient split-ring member disposed in said cavity and axially extending therefrom beyond said outer surface for maintaining said elastomer member spaced from said outer side of said seal gland to prevent internal lubricant pressure from extruding the sealing face of said elastomer member into the clearance between said shaft and said roller member.

4,254,840

DRILL BIT INSERT

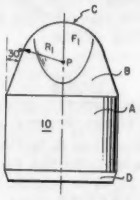
William Shay, Jr., Conroe, Tex., assignor to Reed Tool Company, Houston, Tex.

Filed Oct. 5, 1978, Ser. No. 949,283
Int. Cl.³ E21C *13/00*
U.S. Cl. 175—410 **6 Claims**

1. An insert for a drilling bit, said insert comprising:

a body having a generally cylindrical base section adapted for snug-fitting engagement in a rolling cutter; and,

a protruding end on said body, said end having a substantially frusto-conical lower portion adjacent said cylindrical base section, a tangential, substantially hemispherical end portion formed on said frusto-conical portion, and flats formed on opposing sides of said hemispherical end portion in generally converging orientation.



4,254,841

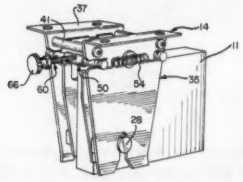
LOAD CELL OVERLOAD PROTECTION DEVICE

Lawrence R. Loskill, Gary, Ind., assignor to Maatschappij van Berkel's Patent N.V., Leidschendam, Netherlands

Filed Oct. 17, 1979, Ser. No. 85,509

Int. Cl.³ G01G *23/06, 23/02*

U.S. Cl. 177—187 **14 Claims**



1. In combination with a load cell, an overload protection device comprising first bracket means fixedly secured to the load cell at the load applying area thereof, second bracket means slidably mounted on said first bracket means and to which a load may be applied, and means on said second bracket means for producing a connection with said first bracket means such that the second bracket means will not slide relative the first bracket means until a predetermined load is applied to said second bracket means and will then slide until the load is transmitted to a support surface whereby the load cell is protected against overloading.

4,254,842

INTERPLANER HINGE JOINT FOR SES SEALS

Alexander Malakhoff, Arlington, Va., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Oct. 29, 1979, Ser. No. 88,897

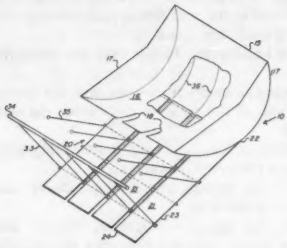
Int. Cl.³ B60V *1/04*

U.S. Cl. 180—126 **8 Claims**

1. In a marine air cushion vessel having a hull with spaced depending sidewalls and a seal structure extending therebetween and including elongated, juxtaposed planer members having longitudinal edge portions, the improvement comprising:

means pivotally connecting said planer members along their adjacent longitudinal edge portions; and

a plurality of spaced support stays secured to the hull and extending longitudinally between the sidewalls, said support stays extending along said longitudinal edge portions of said planer members and being secured to said connecting means.



4,254,843

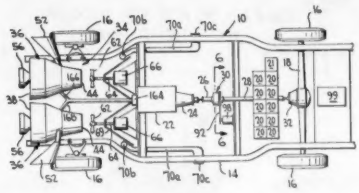
ELECTRICALLY POWERED VEHICLE

Joon H. Han, 816 Gregorio Dr., Silver Spring, Md. 20901, and Tae H. Cho, 19010 Quailvalley Blvd., Gaithersburg, Md. 20760

Continuation-in-part of Ser. No. 46,905, Jun. 8, 1979, abandoned. This application Jul. 20, 1979, Ser. No. 59,130

Int. Cl.³ B60K *1/00*

U.S. Cl. 180—165 **19 Claims**



1. An electrically powered vehicle comprising:

a body supporting wheel means;

driven shaft means supported on said body for rotating said wheel means;

electric motor means supported by said body rotating a drive shaft;

battery means supported by said body supplying electricity to drive said electric motor means;

accelerator means operable by a driver of said vehicle to control electricity supplied by said battery means to said electric motor means to control the speed of rotation of said drive shaft;

electrical generator means connected with said battery means for electrically charging said battery means; and

clutch means coupling said drive shaft and said driven shaft including a drive member carried by said drive shaft, a driven member carried by said driven shaft, flywheel means for driving said electrical generator means, and coupling means connecting said drive member with said driven member and responsive to relative rotational speed of said drive and driven members to connect said driven member with said flywheel means when said driven member is rotating faster than said drive member and to disconnect said driven member from said flywheel means when said drive member is rotating as fast or faster than said driven member whereby said electrical generator is driven to charge said battery means by the momentum of said vehicle.

4,254,844

OVERRIDE CONTROLLER FOR AUTOMATIC MOTOR VEHICLE SPEED CONTROL

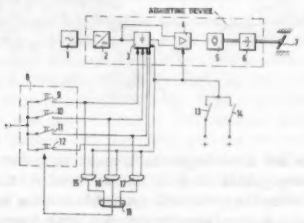
Harald Collonia, Königstein, Fed. Rep. of Germany, assignor to VDO Adolf Schindling AG, Frankfurt am Main, Fed. Rep. of Germany

Filed Dec. 7, 1978, Ser. No. 967,381

Claims priority, application Fed. Rep. of Germany, Dec. 12, 1977, 2755370

Int. Cl.³ B60K *31/00*; F02D *11/10*

U.S. Cl. 180—179 1 Claim



1. In a device for controlling the traveling speed of a motor vehicle with an electrical controller, which controller, by means of an electrical adjusting device in dependency on a desired value which is fed-in by the driver via at least one manually actuatable first actuating elements, acts on an element which influences the ratio of the fuel-air mixture fed to the motor vehicle, particularly the throttle valve, and its adjusting device is switchable inoperatively off by means of second actuating elements, the improvement comprising

means for turning the controller off when at least one of the first actuating elements and at least one of the second actuating elements are in their active position,

said means for turning the controller off comprises,

a plurality of AND gates respectively coordinated to each of individual of said first actuating elements, one input of each of said AND gates is connected with the respective said first actuating elements and the other input of each said AND gates is connected with said second actuating elements,

an OR gate has a plurality of inputs respectively connected to the outputs of all of said AND gates, respectively, and

switch means operatively connected to the output of said OR gate, said switch means for switching the controller off.

4,254,845

BRAKING SYSTEM FOR CONSTRUCTION MACHINES

Günther Braun, Haubahn 26, 56 Wuppertal, Fed. Rep. of Germany

Filed Aug. 25, 1978, Ser. No. 936,870

Claims priority, application Fed. Rep. of Germany, Sep. 6, 1977, 2739994

Int. Cl.³ B60K *17/34*

U.S. Cl. 180—306 17 Claims

1. A braking system for a construction machine, comprising:

a ground engaging drive means;

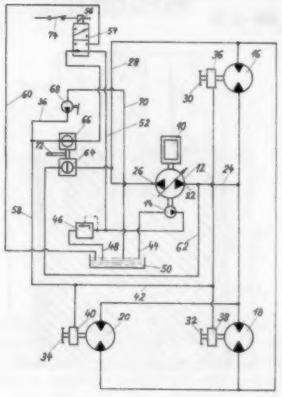
a hydraulic drive system, including a hydraulic motor connected to said ground engaging drive means and a hydraulic pump for supplying fluid under pressure to said motor, said hydraulic drive system being constructed so that said drive means may be braked by varying the discharge volume of the hydraulic pump;

an emergency brake, biased to apply a braking force to said ground engaging drive means;

a means for shunting said hydraulic pump, said shunting means including a first valve, variable between a first position isolating an inlet and an outlet port of said pump and a second position connecting said inlet and outlet ports to shunt said pump;

a means for releasing said emergency brake;

a common actuating means, connected to said shunting means and releasing means, said actuating means being movable between a first position, wherein said hydraulic



pump supplies fluid to drive said motor and said releasing means is actuated to release said emergency brake and a second position, wherein said hydraulic pump is shunted and said releasing means is deactivated so that said emergency brake acts to retard the motion of said ground engaging drive means.

4,254,846

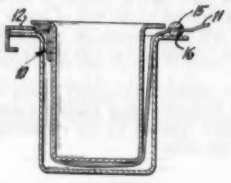
APPARATUS AND METHOD FOR REMOVING LINERS FROM THEIR OUTER CONTAINERS

Davide A. Soave, 44 Winding Rd., Hicksville, N.Y. 11801

Filed May 24, 1979, Ser. No. 41,991

Int. Cl.³ E04G *5/06*; B66F *11/04*

U.S. Cl. 182—46 8 Claims



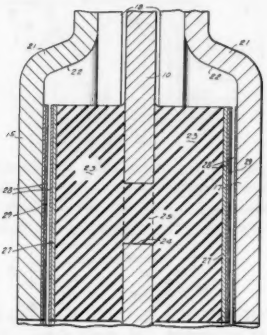
1. An apparatus for removing an electrical insulating liner from the bucket of an aerial lift type truck which comprises:

an elongated strap having attached to one end thereof a hook means, said hook means adapted to engage the upper edge portion of the bucket, said strap being of sufficient length to extend from the hook means down the corresponding inner side wall portion of the bucket across the bottom and up and beyond the opposite side wall portion of the bucket while the liner is fully inserted within the bucket.

4,254,847
RUBBER VISCOUS TORSIONAL DAMPERS AND METHOD OF MAKING SAME

Gordon W. Kamman, Elma, and Ronald L. McLean, Tonawanda, both of N.Y., assignors to Houdaille Industries, Inc., Ft. Lauderdale, Fla.

Filed Jul. 24, 1978, Ser. No. 927,279
Int. Cl.[3] F16F *15/12*
U.S. Cl. 188—1 B 13 Claims



1. In a tuned viscous torsional vibration damper assembly of the type having circular supporting plate means with a radially outwardly extending circular body and a radially inner hub portion adapted to be secured to a rotary member such as a crankshaft subject to vibrations to be damped by the damper, said body being received concentrically within a radially inwardly opening annular working chamber of an annular inertia mass, a viscous damping medium in said chamber between shear film spaced working surfaces of said body and said inertia mass, said inertia mass having concentric annular grooves of substantial radial extent and located at opposite sides of and facing axially toward said body contiguous to the opening from said chamber, said grooves having axially directed annular face areas on said inertia mass facing toward oppositely axially facing face areas on said body, and elastic tuning spring, spacing and sealing rings of radial extent similar to that of the radial extent of said grooves and having opposite axially directed sides attached to and coupling said face areas of said inertia mass in said grooves with said face areas on said body, the improvement comprising:

separate substantially flat annular disks of substantially the same radial extent as said elastic rings;

each of said disks being rigidly unyielding in its radial plane and having oppositely facing axially directed faces;

one of said disks having one of its axially directed faces vulcanize bonded to one side of one of said elastic rings;

another of said disks having one of its axially directed faces vulcanize bonded to one side of the other of said elastic rings;

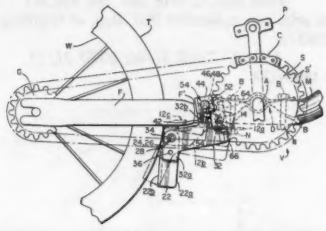
and adhesive means permanently rigidly securing said disks in place in fluid sealing relation against the face areas respectively opposed by the remaining axially directed faces of the disks.

4,254,848
SPROCKET-ACTUATED BRAKE

Mark D. Moss, Hollidaysburg, Pa., assignor to Hedstrom Co., Bedford, Pa.

Filed Oct. 10, 1978, Ser. No. 949,519
Int. Cl.[3] B62L *1/00*
U.S. Cl. 188—24 7 Claims

1. A sprocket-actuated brake of the type including a bracket for mounting on the bike between its rear fork and pedal sprocket, a brake shoe pivotally connected to the bracket and swingable against the rear bike tire, actuating means connected to the shoe having a part engageable by the teeth of the pedal sprocket to press the shoe against the tire when the sprocket is rotated in reverse through a small angle, the improvement wherein said part comprises a link pivotally connected at one sprocket-engageable end to said actuating means and means for

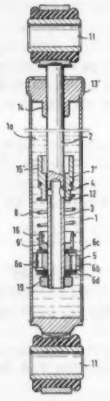


biasing the link about its pivotal connection so that its opposite sprocket-engageable end is urged toward the sprocket whereby when the sprocket is rotated in reverse, said opposite link end acts as a lead into the sprocket teeth ensuring that said one link end bottoms between adjacent sprocket teeth when force is transmitted to the brake shoe.

4,254,849
DAMPING ARRANGEMENT

Hans Pohlenz, Koblenz, Fed. Rep. of Germany, assignor to Stabilus GmbH, Koblenz-Neuendorf, Fed. Rep. of Germany

Filed Dec. 19, 1978, Ser. No. 970,969
Claims priority, application Fed. Rep. of Germany, Dec. 24, 1977, 2758083
Int. Cl.[3] F16F *9/34*
U.S. Cl. 188—275 10 Claims



1. A damping arrangement comprising:

(a) a cylinder member having an axis and bounding a cavity therein;

(b) a piston rod sealingly engaging said cylinder member for axial movement inward and outward of said cavity;

(c) a liquid in said cavity;

(d) a piston member mounted on said piston rod in said cavity and axially defining two compartments of said cavity,

(1) said piston member being formed with at least one throttling passage for restricted flow of said liquid between said compartments,

(2) said piston rod being formed with a bore having re-

spective orifices in said compartments for by-passing said piston member,

(e) an inert mass mounted on said piston rod for axial movement in one of said compartments between two axially terminal positions;

(f) blocking means movable in said cavity toward and away from a blocking position in which said blocking means impedes flow of said liquid through one of said orifices, said blocking means constituting a portion of said inert mass and said blocking means being moved toward and away from said blocking position in response to said axial movement of said mass;

(g) a spring interposed between said mass and said piston rod for biasing said mass toward a pre-determined axial position spacedly intermediate said terminal positions, ; and

(h) hydraulic damping means for damping axial movement of said mass in a direction away from said intermediate position and toward both of said terminal positions to prevent contact with said piston and the end wall of said cylinder member in said compartment, said damping means comprising first damping elements on said inert mass and a second damping element on each of said piston and end wall in said one compartment, one of said first and second elements bounding a receptacle open axially toward the other element, the other element being dimensioned to be received in said receptacle during axial movement of said mass.

4,254,850

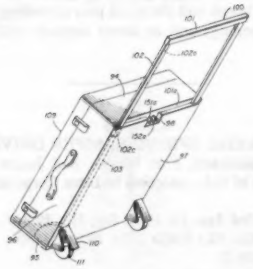
LUGGAGE CASE

Harford E. Knowles, 2718 Jackson St., Hollywood, Fla. 33020

Filed Oct. 29, 1979, Ser. No. 88,875

Int. Cl.³ A45C *5/14*

U.S. Cl. 190—18 A **9 Claims**



1. In a luggage case wherein there is the combination of an opening in a wall thereof, door means registerable with said opening, wheel means stored in said case adjacent said opening, operating means for simultaneously extending and retracting said wheel means and opening and closing said door means, and handle means for actuating said operating means, the improvement in which:

(a) the wheel means comprises a wheel **(111)** mounted on a wheel support member which is pivotally supported by said luggage case and has a first slot **(106)**; and

(b) the operating means comprises a second slot **(107)** adjacent said first slot, slot engaging means **(104)** extending through both said slots, and connection means **(103)** connected to said slot engaging means **(104)** and to said handle means.

4,254,851

BUS BAR SWITCH FOR TROLLEY-TYPE TRANSPORTATION SYSTEM

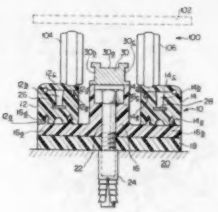
Takanoru Setoguchi, Yokosuka, and Yoshiaki Hidaka, Yokohama, both of Japan, assignors to Nissan Motor Company, Limited, Japan

Filed Jun. 7, 1979, Ser. No. 46,224

Claims priority, application Japan, Jun. 22, 1978, 53-74909

Int. Cl.³ B60M *1/04*

U.S. Cl. 191—31 **8 Claims**



1. A bus bar switch for a trolley-type transportation system including an electric motor vehicle, a current collector device carried by said vehicle, and a bus bar unit on which said current collector device rides to transmit current carried by said bus bar unit to said vehicle to drive the same, said bus bar switch comprising:

a first point section of said bus bar unit which is stationary and has a first end;

a second point section of said bus bar unit which is swingable about a pivotal portion thereof to allow a second end thereof to align with said first end;

a third point section of said bus bar unit which is swingable about a pivotal portion thereof to allow a third end thereof to align with said first end;

a link spanned between said second and third point sections to assure synchronous swinging movements of them about the respective pivotal portions allowing said second and third ends of them to selectively align with said first end;

a coupler for coupling one of said second and third ends with said first end by receiving therein both said one and said first end, said coupler being slidable along said first point section from an inoperative position wherein said coupler fails to have a section thereof projected longitudinally outwardly from said first end, to an operative position wherein said coupler succeeds in having a section thereof projected longitudinally outwardly from said first end;

operating means for operating both the unit of said second and third point sections and said coupler in such a manner that when both of said second and third ends are away from said first end, said coupler is kept in said inoperative position and when alignment between one of said second and third ends and said first end becomes established, said coupler is brought into said operative position thereby to couple said one with said first end; and

holding devices for selectively and sealingly holding said second and third ends when these ends are away from said first end.

4,254,852

FREE-WHEELING MECHANISM

Hector M. Orozco, Fuego No. 986 Pedregal de San Angel, Mexico 20, D.F., Mexico

Filed Jul. 7, 1978, Ser. No. 922,886

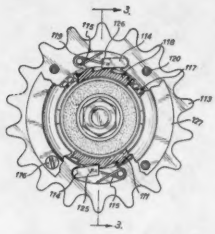
Claims priority, application Mexico, Jan. 2, 1978, 171911

Int. Cl.³ F16D *41/18*

U.S. Cl. 192—46 **9 Claims**

1. A freewheel mechanism comprising a tubular sleeve internally threaded for attachment to a wheel hub, a sprocket wheel having a central aperture defining an inner periphery dimen-

sioned to seat coaxially around said sleeve, two cup members also apertured coaxially to seat around said sleeve and located one on each side of said sprocket wheel, said cup members each having a radially outwardly directed peripheral rim with the sprocket wheel sandwiched between and secured to said cup member rims, said sleeve having a peripheral ridge defined between two upstanding shoulders and each said shoulder cooperating with an internal shoulder on the juxtaposed cup member to define a ball race permitting free rotation of the secured sprocket wheel and cup members on said sleeve, said



sprocket wheel being engageable with said sleeve for positive rotation therewith by a ratchet assembly comprising at least one ellipsoidal recess opening into the inner periphery of said sprocket wheel, an unsecured rockable pawl retained within said recess by mating contours on said pawl and one end of said ellipsoidal recess, spring means disposed within the opposite end of said recess and attached to said pawl to retain said pawl seated within the recess and to urge said pawl outwardly into driving engagement with said sleeve, and a plurality of pawl receiving indentations disposed in line peripherally around said ridge between said upstanding shoulders on the sleeve.

4,254,853

FRICTION CLUTCH

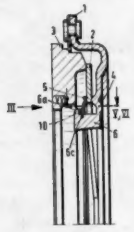
Lothar Huber, Bühl/Altschweier, Fed. Rep. of Germany, assignor to LUK Lamellen und Kupplungsbau GmbH, Bühl, Fed. Rep. of Germany

Filed Apr. 3, 1978, Ser. No. 892,925

Claims priority, application Fed. Rep. of Germany, Apr. 2, 1977, 2714929

Int. Cl.³ F16D *13/50*

U.S. Cl. 192—70.27 **20 Claims**



1. Friction clutch wherein a plate spring is mounted on a clutch component for pivoting relative thereto, the plate spring being held between first bracing means formed on a side of the clutch component and an annular plate-like second bracing means disposed at a side of the plate spring facing away from the clutch component, at least one of the first and second bracing means being yieldable, holding means fastened to the clutch component and extending through the plate spring for bracing the second bracing means against the plate spring, the improvement therein comprising a bayonet-like locking connection effective between the holding means and the annular plate-like second bracing means.

4,254,854

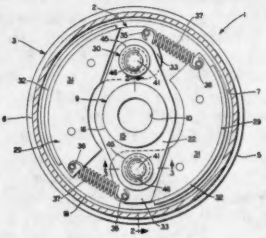
CENTRIFUGAL CLUTCH SHOE MOUNTING ARRANGEMENT

Richard C. St. John, North Canton, Ohio, assignor to Dyneer Corporation, Canton, Ohio

Filed Jan. 8, 1979, Ser. No. 1,597

Int. Cl.³ F16D *43/24*

U.S. Cl. 192—105 CD **10 Claims**



1. An improved clutch shoe mounting arrangement for a centrifugal clutch construction of the type having an outer driven member adapted to be couplingly engaged by an inner drive rotor assembly, in which the rotor assembly has a backing plate and an axially spaced flange which are mounted on a hub of the rotor assembly for rotation with said hub, in which a pair of clutch shoes are pivotally mounted between the backing plate and spaced flange by a pair of pivot pins which extend between and through axially aligned openings formed in the backing plate, spaced flange and clutch shoes, wherein the improvement includes: bushing means formed with a central bore seated in each of the backing plate and flange openings, with the pivot pins being telescopically mounted within said bushing means bores; and the pivot pins extending through the clutch shoe openings and in direct contact with the clutch shoes.

4,254,855

COAXIAL SPRING DAMPER DRIVE

William G. Hildebrand, Fort Wayne, and James K. Tarlton, Auburn, both of Ind., assignors to Dana Corporation, Toledo, Ohio

Filed Jun. 18, 1979, Ser. No. 49,847

Int. Cl.³ F16D *3/14, 69/00, 3/80*

U.S. Cl. 192—106.2 **7 Claims**

1. A torque transmitting device comprising:

a rotatable drive member,

a rotatable driven member adapted for limited rotation relative to said drive member,

a main and auxiliary cover secured to one of said drive and driven members for rotation therewith,

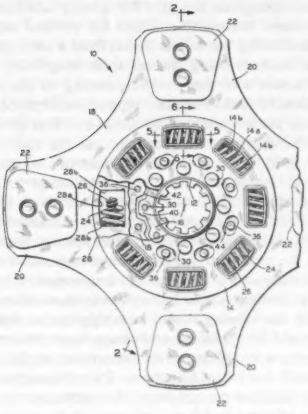
means defining at least one opening in each of said drive member or driven member and said main and auxiliary covers, each of said openings being aligned with the other and having spaced side walls,

resilient means in said openings for resiliently and drivingly connecting said drive and driven members,

said resilient means comprising a first resilient member and a second resilient member disposed within said first resilient member,

said first resilient member having end portions in driving engagement with said side walls in one of said drive mem-

ber, said driven member and said auxiliary cover openings. and said second resilient member having end portions in driving connection with said auxiliary cover opening side walls.

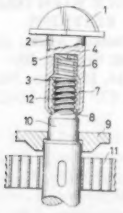


4,254,856

COUPLER OF WINDING KEY WITH POWER SPRING

Fumito Komatsu, Shiojiri; Yasuto Kudo, Chino, and Tadashi Kamijima, Nagano, all of Japan, assignors to Kabushiki Kaisha Sankyo Seiki Seisakusho, Japan

Filed Mar. 2, 1979, Ser. No. 17,027
Claims priority, application Japan, Mar. 10, 1978, 53/31168[U]
Int. Cl.³ F16D 13/12
U.S. Cl. 192—415 13 Claims



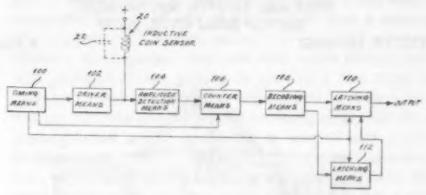
1. A coupler of a winding key with a power spring which is wound by rotation of a winding shaft connected thereto comprising a male thread member formed on one of the winding shaft and the winding key, a bottomed aperture having an inwardly extending bevel portion at an open end thereof formed in the other of the winding shaft and the key, a coiled spring disposed and loosely fitted in the aperture, locking means formed by said bevel portion for preventing withdrawal of said spring by engagement with said bevel portion, the male thread member being threadably engaged with said coiled spring to couple the key with the winding shaft, a rotation of the key in a direction to unwind and spread the coil spring radially achieving the transmission of a rotating drive from the key to the winding shaft, and a rotation of the key in the opposite direction causing the winding of the spring on the male thread member and an idle rotation of the key.

4,254,857

DETECTION DEVICE

Joseph L. Levasseur, Chesterfield; William A. Selter, St. Louis County, and Calvin J. Christensen, Jefferson County, all of Mo., assignors to H. R. Electronics Company, High Ridge, Mo.

Filed Sep. 15, 1978, Ser. No. 942,534
Int. Cl.³ G07F 3/02
U.S. Cl. 194—100 A 30 Claims



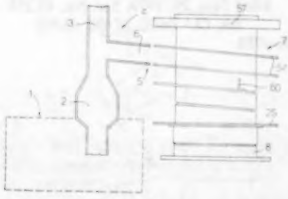
1. A metal detector comprising a circuit element having inductance and capacitance and circuit means connected thereto, said circuit being capable of producing an oscillating condition, means for repetitively impulsing the circuit elememt to produce a series of timed bursts of oscillations therein the frequency, magnitude and duration of each burst of which depend upon the inductance, capacitance and resistance of said element, means for positioning an object to be detected in the field of said element during the time said circuit element is being repetitively impulsed whereby the bursts of oscillations produced therein are modified as to frequency, magnitude and duration characteristics and differ from the frequency, magnitude and duration characteristics of the element when no object is in the field thereof, which characteristics are representative of the object, and means operatively connected to said circuit element to respond to a particular characteristic of said bursts of oscillations.

4,254,858

VARIABLE CAPACITY RESERVOIR FOR ROD SHAPED ARTICLES, PARTICULARLY CIGARETTES

Enzo Seragnoli, Bologna, Italy, assignor to G. D. Societa per Azioni, Bologna, Italy

Filed Jul. 6, 1979, Ser. No. 55,328
Claims priority, application Italy, Jul. 21, 1978, 3501 A/78
Int. Cl.³ B65G 37/00, 13/02
U.S. Cl. 198—347 7 Claims



1. A variable capacity reservoir for rod shaped articles, particularly cigarettes, comprising:

a vertically upstanding fixed member;

a movable helical band for supporting said rod shaped articles; wherein said helical band has a free end and is formed of a resilient material;

said band is collapsed at zero storage capacity and is expanded along said vertically upstanding fixed member at maximum capacity.

engaging means between said helical band and said fixed member enabling said helical band to rotate helically in engagement with said fixed member;

reversible drive means for rotating said helical band in respective rotational directions with respect to said fixed member; and

means for transferring said rod shaped articles to and from said helical band as said helical band is rotated in respective rotational directions.

4,254,859

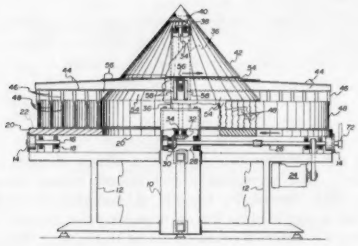
CIRCULAR MAIL SINGULATOR

Robert J. Basso, 5333 E. Palisades Rd., San Diego, Calif. 92116

Filed Aug. 13, 1979, Ser. No. 65,917

Int. Cl.³ B65G *47/12, 29/00*

U.S. Cl. 198—443 **8 Claims**



1. A circular mail singulator comprising:

(a) a fixed continuous vertical spiral baffle;

(b) a rotating table having a frictional surface disposed beneath said baffle and rotating in a direction such that envelopes purchased by said frictional surface are drawn radially outwardly by the increasingly large convolutions of said baffle and increased in linear speed;

(c) delivery means for delivering said envelopes to an inner convolution of said spiral baffle;

(d) said delivery means comprising a cone mounted centrally over said baffle and positioned to slide mail dropped thereon out the innermost convolution of said baffle, at least a portion of said cone rotating counter to the direction of rotation of said table to ensure proper feeding of envelopes into said spiral baffle; and

(e) conveyor means for removing singulated envelopes from the outermost convolution of said baffle.

4,254,860

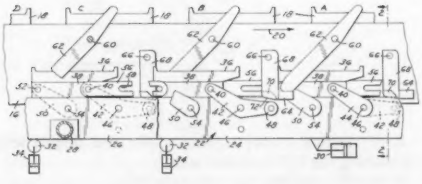
LIFT AND CARRY ACCUMULATING CONVEYOR

Richard D. Koontz, Pontiac, Mich., assignor to F. Jos. Lamb Company, Warren, Mich.

Filed May 29, 1979, Ser. No. 43,255

Int. Cl.³ B65G *25/00, 43/08*

U.S. Cl. 198—751 **9 Claims**



1. An accumulating conveyor of the lift and carry type comprising a stationary horizontally extending support having a series of successive stations spaced regularly therealong at which workpieces are adapted to be supported, transfer bar means extending lengthwise of said stations, means for reciprocating said transfer bar means vertically through a predetermined distance and horizontally through a distance corresponding to the spacing between successive stations, said reciprocating means being adapted to move the transfer bar means horizontally in a downstream direction when in raised position and horizontally in an upstream direction when in a lowered position, a series of work carriers supported on the transfer bar means by parallelogram linkages for bodily horizontal and vertical movement therewith and also for vertical movement relative to the transfer bar means to and from a work-engaging position, said carriers being spaced apart lengthwise of said transfer bar means a distance corresponding to the distance between successive stations on said support, workpiece sensing means at each station adapted to assume a first position in response to the absence of a workpiece at the station and a second position in response to the presence of a workpiece at the station, one link of each parallelogram linkage comprising a bell crank pivotally supported between its ends on the transfer bar means and having one end pivotally connected to said carrier, means operably connecting each sensing means with the carrier at the next upstream station and responsive to vertical upward movement of the transfer bar means to raise the carrier relative to the transfer bar means to its work-engaging position when the sensing means operably connected therewith assumes said first position, and means interconnecting the successive carriers for raising all of the carriers on the transfer bar means which are located upstream from the carrier raised by the sensing means at the last empty downstream station, said carriers being adapted to lift workpieces off the support rails when the transfer bar means are fully raised and to advance the lifted workpieces downstream and deposit them on the support at the next downstream station in response to advancing and lowering the transfer bar means, said operable connection between said sensing means and a carrier including a member movably mounted on said support at each station, said member lying in the vertical path of travel of said other end of the associated bell crank when the associated sensing means assumes said first position such as to pivot said parallelogram linkage to raise the carrier on the transfer bar means in response to upward movement of the transfer bar means, each sensing means when in said second position causing the associated movable member to assume a bypassing position relative to said other end of the associated bell crank when the transfer bar means is raised.

4,254,861

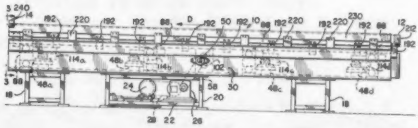
CONVEYING DEVICE WITH OBJECT HOLDING STATIONS

Henry A. Schuricht, Pontiac, Mich., assignor to AMSTED Industries Incorporated, Chicago, Ill.

Filed Sep. 14, 1979, Ser. No. 75,606

Int. Cl.³ B65G *25/02*

U.S. Cl. 198—774 **1 Claim**



1. A conveying device for moving objects between an entrance and an exit, said device comprising,

a power distribution plenum defined by an outer and inner elongated channel member separated by a series of tube supports positioned transversely between said members, bearing means carried by said tube supports for journaling a centrally located primary input shaft and secondary drive shafts positioned on each side of said primary shaft, said secondary shafts operatively connected to said primary shaft to provide a synchronized rotation of all said shafts,

a drive plenum carried by said conveying device adjacent to said power distribution plenum, said drive plenum defined

by an elongated top and bottom channel cover affixed to said inner channel member, a series of vertical supports carried by said channel covers on a side opposite said inner channel member, said supports spaced periodically between said entrance and said exit, pairs of vertically spaced outer ball transfer means carried by said vertical supports to project into said drive plenum, pairs of inner vertically spaced ball transfer means positioned in openings formed in said inner channel member and carried by a plate affixed to said channel member, said inner ball transfer means projecting into said drive plenum and positioned in an opposing manner with respect to said outer ball transfer means, and a drive plate assembly carried between said inner and outer ball transfer means with said drive plate assembly having first wear surfaces attached to a drive plate for engagement with said ball transfer means so as to maintain said drive plate assembly movable in a vertical plane,

reciprocating means including a horizontal cam assembly carried on an inner end of said primary input shaft, said shaft extending into said drive plenum with said cam assembly having an eccentrically offset cam bearing engaging second wear surfaces affixed on each side of an elongated vertical opening in said drive plate of said drive plate assembly, and vertical cam assemblies carried one each on an inner end of said said secondary drive shafts, said secondary shafts extending into said drive plenum with each said vertical cam assembly having an eccentrically offset cam bearing engaging respectively a third wear surface affixed along a top of a series of elongated horizontal openings in said drive plate, and

conveying means comprising an elongated pair of spaced stationary rails carried by said drive plenum thereabove and extending from said entrance to said exit, and a pair of spaced movable rails carried adjacent to said stationary rails and operatively connected to said drive plate assembly,

wherein rotation of said primary drive shaft causes a like rotation of said secondary drive shaft to engage said cam assemblies with said wear surfaces of said drive plate assembly so as to reciprocate said movable rails, said movable rails engaing a lower surface of said object likewise carried by said stationary rails, said movable rails intermittently lifting and carrying said objects toward said conveyor exit.

4,254,862

FOLDABLE DISPOSABLE SHARPS CONTAINER

Don C. Barratt, 1255-3B Weathervane La., Akron, Ohio 44313

Filed Dec. 20, 1978, Ser. No. 971,305

Int. Cl.³ A61B *17/06*

U.S. Cl. 206—63.3 **10 Claims**

1. A reopenable, disposable sharps container comprising:

(a) an outer casing having a planar top section and a planar bottom section connected by a hinge section;

(b) at least one of said planar sections being foldably connected to a back panel fitted upon said planar section thereby converting said at least one planar section into a flat pocketed planar section;

(c) at least one resilient pad attached to at least one of said planar sections; and

(d) at least two types of two-part retaining means integrally formed into said planar sections for reopenably retaining said container in a folded, closed position via a hierarchy of retaining levels by the engagement of a first protruding part of a first type of retaining means having a first width connected to one of said planar section with a second apertured part of a corresponding type of retaining means havng a width greater than said first width formed into said pocketed planar section to provide a first level of clsoure retaining, and by the engagement of a first protruding part of a second type of retaining means having a predetermined width connected to one of said planar sections with a second apertured part of a corresponding type of retaining means having a width substantially the same as said predetermined width formed into said pocketed planar section to provide a second level of closure retaining.

4,254,863

BARBECUE PACK

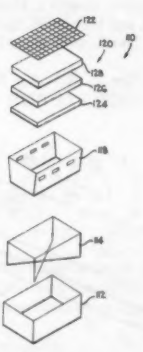
Michael W. Katcs, Johannesburg; Peter J. De Luca, Krugersdorp, and Peter S. Pretorius, Sandton, all of South Africa, assignors to Burco (Proprietary) Limited, Johannesburg, South Africa

Filed Jul. 3, 1979, Ser. No. 54,495

Claims priority, application South Africa, Oct. 20, 1978, 78/5935

Int. Cl.³ B65D *85/00*; F24C *1/16, 3/00*

U.S. Cl. 206—216 **17 Claims**



1. A barbecue pack which is ready for immediate use and immediate ignition and which includes

combustible fuel members;

an igniting means for igniting the fuel members;

a fire container that is of a non-combustible material in which the fuel members and the igniting means are contained, with the fuel members being located above the igniting means and with the igniting means being accessible to be readily ignitable;

a grid on which food to be cooked may be supported; and

an assembled unitary framework structure of a non-combustible material in which the fire container is located and which supports the fire container, and which also supports the grid in position above the fire container without any assembly, construction or packing required, such that the

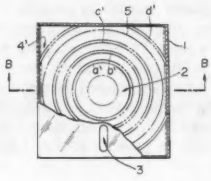
igniting means may be immediately ignited and food may be immediately placed on the grid to be cooked.

4,254,864

PROTECTIVE JACKET FOR PLANE MAGNETIC RECORDING MEDIUM

Chiho Mikura, Tokyo, Japan, assignor to TDK Electronics Company Limited, Tokyo, Japan

Filed Mar. 13, 1979, Ser. No. 20,061
Claims priority, application Japan, Apr. 3, 1978, 53-43610
Int. Cl.³ B65D *85/30, 85/57*
U.S. Cl. 206—313 **3 Claims**



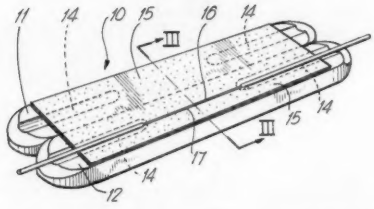
1. A protective jacket for rotatably holding therein for rotation about an axis, a plane disc recording medium, said jacket including at least one buffer sheet bonded on the inner surfaces of said jacket, said at least one sheet contacting both planar surfaces of said disc, wherein said at least one buffer sheet is bonded to said jacket by a bond in the form of a plurality of gaps formed in said at least one buffer sheet forming concentric circles about said axis.

4,254,865

PROTECTIVE PACKAGE FOR AN OPTICAL FIBER SPLICE

Grant K. Pacey, Nepean; Ronald F. Hughes, Ottawa; William P. Trumble, Kanata, and Helmut H. Lukas, Ontario, all of Canada, assignors to Northern Telecom Limited, Montreal, Canada

Filed Oct. 2, 1979, Ser. No. 81,204
Int. Cl.³ G02B *5/15;* **B65D** *85/20, 85/38*
U.S. Cl. 206—316 **14 Claims**



1. A protective package for enclosing and protecting a fusion spliced pair of optical fibers, each fiber having an uncoated portion immediately adjacent to the splice and a coated portion spaced from the splice, the package comprising:

two elongate plastic members each having a front face;

an elongate groove in each front face at each end of each member;

a layer of pressure sensitive adhesive material extending over each said front face of each member and overlying said grooves;

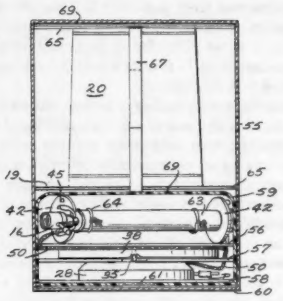
the elongate grooves of a cross-section such that the grooves fit closely over said coated portions of said fibers, when said members are in face to face assembly, the adhesive material in contact with the coated portions of fibers in the grooves and in contact with the uncoated portions of the fibers adjacent to the fusion splice.

4,254,866

KNOCK-DOWN FLOOR LAMP

Gene T. Fales, Greensboro, and James R. Mullins, Burlington, both of N.C., assignors to Dunning Industries, Inc., Greensboro, N.C.

Filed Jun. 18, 1979, Ser. No. 49,409
Int. Cl.³ B65D *85/00, 85/42, 77/04*
U.S. Cl. 206—320 **18 Claims**



1. An unassembled prewired lamp disposed in a package and adapted to be assembled into a lamp, said lamp comprising

a first elongated tubular turning having a socket formed at a first end thereof;

a second elongated tubular turning;

a base having an electrical cord passageway formed therein;

means formed with said base and at a first end of said second turning for operatively releasably attaching said base and second turning together;

means formed at a second end of said first turning and a second end of said second turning for releasably fastening said turnings together; and

an electrical cord operatively electrically connected to said socket at a first end thereof and extending through said first and second turnings and said electrical cord passageway in said base and being movable with respect to said turnings and base, and having a plug at a second end thereof; said plug being sized with respect to said base passageway so that it cannot be pulled through said passageway; and said cord being significantly longer than the sum of the lengths of said turnings and said base passageway.

4,254,867

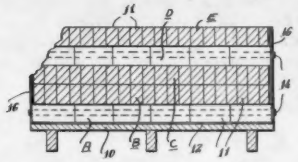
PACKAGE AND METHOD FOR TRANSPORTING LOOSE BRICK

Leonard J. Capozziello, and David J. Capozziello, both of 77 Palm St., Bridgeport, Conn. 06610

Filed Jun. 29, 1979, Ser. No. 53,368
Int. Cl.³ B65D *85/46, 63/02, 19/00*
U.S. Cl. 206—322 **7 Claims**

1. A combination pallet and package for transporting loose brick comprising: a flat frictional sheet on said pallet, a plurality of superposed rows of loose brick stacked juxtaposed to each other on said flat sheet at least one of said rows having more bricks than another row whereby at least two edges of said row projects beyond the corresponding edges of said other row, a stiff but bendable sheet encircling the exposed edges of said bricks, a pair of flexible straps each being placed around the outside surfaces of said bendable sheet juxtaposed

to said first and fourth row of bricks, and securing means for said strap which draws said strap in an endless loop in tight engagement with said outside surfaces of said bendable sheet to form a compact and secure brick package.

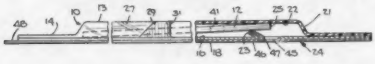


4,254,868

ENCLOSURE FOR A SECURITY TAG AND EXTRACTION IMPLEMENT

David R. Humble, Plantation, and Marlene J. Dietrich, Coral Springs, both of Fla., assignors to Sensormatic Electronics Corporation, Deerfield Beach, Fla.

Filed Feb. 5, 1979, Ser. No. 9,256
Int. Cl.[3] B65D 73/02
U.S. Cl. 206—484 8 Claims



1. An enclosure for securing to a flat surface of an article which is to be maintained under surveillance against unauthorized transport through a surveillance zone a lamelliform component which is detectable by a surveillance device whenever said component enters said zone; said enclosure having a raised central portion bounded by a peripheral planar flange portion, and means applied to the underside of said flange portion for adhesively bonding said enclosure to said flat surface of an article; said central portion having in plan a contour corresponding to that of said component, a ceiling whose interior elevation as measured from the underside of said flange portion exceeds the thickness of said component by at least a few mils, and an exterior elevation sufficiently low as to resist grasping by human fingers; said enclosure being formed from a tough tear resistant plastic material which is severable by a razor edge implement to permit authorized extraction of said component from said enclosure; and said enclosure including means constructed and arranged whenever said enclosure contains one of said components to elevate at least one end of said component toward said ceiling to provide clearance for said implement to penetrate a side wall of said raised portion and pass between the underside of said component and the upper surface of said flange portion.

4,254,869

MERCHANDISING PACKAGE FOR CONTAINERS AND METHOD OF MAKING

Robert J. Heier, Whitehouse, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Filed Jul. 12, 1979, Ser. No. 57,139
Int. Cl.[3] B65D 65/00, 75/26
U.S. Cl. 206—497 13 Claims

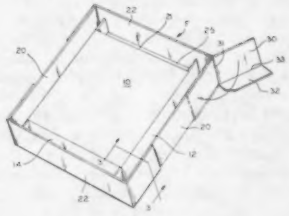
1. The method of making a double-wrapped pack comprising the steps of shrink-wrapping a plurality of similarly-shaped articles in a first heat-shrinkable ethylene polymer film to form a first package, assemblying a plurality of said packages to form an aligned group, and shrink-wrapping said aligned group within a second heat-shrinkable ethylene polymer film to form a second package, the contacting interface of one of said films being coated with a thin, substantially-continuous release coating of solvent-based polyamide to facilitate ready separation of said films upon opening of said second package.

4,254,870

CUSHIONING FORM

Allan E. Foote, Naperville, and Steven J. Benzschawel, St. Charles, both of Ill., assignors to Container Corporation of America, Chicago, Ill.

Filed Jan. 28, 1980, Ser. No. 115,696
Int. Cl.[3] B65D 81/02, 85/30
U.S. Cl. 206—524 4 Claims



1. A cushioning material holding form, formed of a unitary blank of foldable paperboard, or the like, for use in protecting a packaged article within an outer shipping container, comprising:

(a) a horizontal central panel;

(b) a plurality of vertical inner panels foldably joined to and depending from side edges of said central panel;

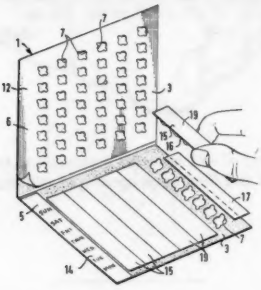
(c) a plurality of relatively narrow, horizontal outer panels foldably joined to and extending outwardly from lower edges of respective vertical inner panels;

(d) a plurality of vertical outer panels foldably joined to and upstanding from the outer edges of respective horizontal outer panels above the plane of said horizontal central panel;

(e) said vertical panels and said horizontal outer panels defining with said central panel a cavity disposed around and above said central panel for holding cushioning material; and

(f) certain of said vertical inner panels having extensions projecting from ends thereof toward related vertical outer panels.

4,254,871
PACKAGING ELEMENT
Albert C. G. Poore, New Malden, England, assignor to Sterling Drug Inc., New York, N.Y.
Filed May 29, 1979, Ser. No. 43,095
Claims priority, application United Kingdom, May 30, 1978, 24381/78
Int. Cl.³ B65D *83/04, 85/56*
U.S. Cl. 206—534 **18 Claims**



1. A packaging element for mounting blister strips containing a course of medication for a patient, which element comprises a lamina foldable along a straight line dividing the lamina into a supporting member and a backing member so that when the lamina is folded the one faces of the members lie adjacent, characterised in that the supporting member is provided with a plurality of apertures for receiving the blisters of a plurality of prepackaged blister strips when the blister strips are mounted on the one face of the supporting member so that the blisters project through the member and form a matrix in which the blister strips are aligned with the columns of the matrix, each of said blister strips containing a single regimen of medicine and being sealed with a frangible membrane, the backing member being provided with a plurality of apertures arranged so that when blister strips are mounted on the supporting member and the lamina is folded the contents of the blisters may be removed through the backing member, the one faces of the members bearing a compatible pressure-sensitive adhesive capable of securing blister strips to the two members and of bonding together the one faces of the two members, the other face of the supporting member bearing or being adapted to receive in relation to each row of the matrix directions as to the day on which the contents of the blisters in the row are to be administered and further being adapted to receive directions in relation to each column of the matrix as to the time of each day for administration of the contents of blisters in the column, the element further characterised in that it comprises one or more protective release sheets strippably adhered to the pressure-sensitive adhesive.

4,254,872
PORTABLE MAIL DELIVERY TRAY
Donald B. Garrett, 2021 Allendale, Lufkin, Tex. 75901
Filed May 7, 1979, Ser. No. 36,870
Int. Cl.³ B65D *1/36*
U.S. Cl. 206—561 **6 Claims**

1. The portable mail delivery tray for retaining a sorted bundle of main upon the passenger seat of a motor vehicle operated by a mail carrier for rapid identification and delivery of the mail, comprising:

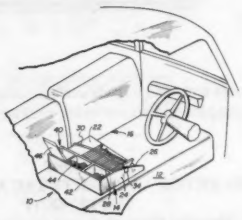
a rigid platform for supporting the tray upon the passenger seat of a vehicle;

a rear support means extending upwardly from said platform;

a substantially planar inclined member supported upon and sloping downwardly from said rear support means to the front edge of said platform;

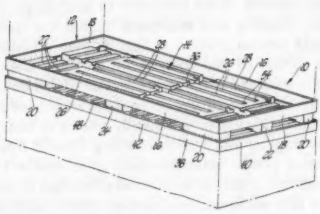
a front wall extending upwardly from the front edge of said platform, said front wall being substantially perpendicular to the front edge of said platform;

a side wall extending transversely along one side of said inclined support member, said side wall being perpendicular to said inclined support member; and



a restraining means attachable from the rear support means to the front wall for retaining a sorted bundle of mail upon the inclined support member, whereby the mail carrier may withdraw the next to be delivered article of mail from the bundle while said restraining means keeps the remaining articles of mail in their sorted order.

4,254,873
PALLET
James M. Cook, III, Bloomfield Hills; Dennis M. Foy, West Bloomfield, and Lyle H. Shuert, Rochester, all of Mich., assignors to Oakland Plastics Corporation, Troy, Mich.
Filed Sep. 18, 1978, Ser. No. 943,436
Int. Cl.³ B65D *19/00*
U.S. Cl. 206—599 **17 Claims**



1. A pallet system comprising: a pallet made of organic polymeric material; said pallet being a unitary structure having a deck including four sides and providing a load-supporting surface; a plurality of spaced, hollow legs projecting from the opposite surface of said deck; a plurality of hollow reinforcing ribs projecting from said opposite surface to define channels in said load-supporting surface; a hollow ridge projecting from said opposite surface and extending continuously along said sides and completely about the periphery of said deck to define a peripheral groove in said load-supporting surface; a panel defining a wall with an edge of said wall disposed in said groove to define a lateral enclosure; at least one transverse ridge projecting from said opposite surface and extending between opposite sides of said deck to define a transverse groove in said load-supporting surface for receiving the bottom edge of a transverse wall whereby walls may extend upwardly from said deck to divide and separate said load-supporting surface into discrete areas; said channels defined by said reinforcing ribs having a different dimension than said grooves defined by said ridges; and including a flange extending vertically upwardly above said load-supporting surface of

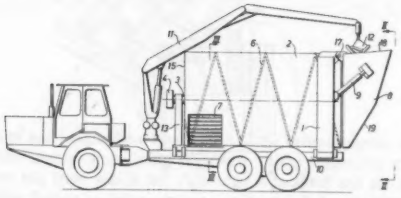
said deck about the outer periphery thereof and defining the outer wall of said groove and engaging the outer surface of said wall disposed in said groove in said pallet.

4,254,874

DEVICE FOR COLLECTING AND PROCESSING TREE STUMPS

Erik Arnoldsson, and Lars-Ake Björklund, both of Söderhamn, Sweden, assignors to Kockums Industri AB, Fack, Sweden

Filed Apr. 13, 1979, Ser. No. 29,767
Int. Cl.³ B03B 1/00; B07B 1/22
U.S. Cl. 209—3 **19 Claims**



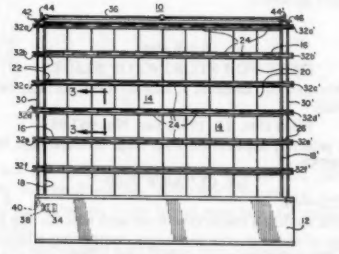
11. An apparatus for collecting tree stumps and processing same to remove therefrom earth, stones and other undesired loose material, said apparatus comprising a wheeled vehicle, an elongated cylindrical container having two opposite ends and supported by said vehicle so as to be rotatable about an axis extending in the longitudinal direction of said vehicle, said container being adapted to simultaneously accomodate a plurality of tree stumps and being provided at one end thereof with first opening means for charging tree stumps into the container and being further provided, at the mantle thereof with second opening means different than said first opening means for discharging earth, stones and other undesired loose material therefrom, and a motor with transmission means carried by said vehicle for rotating said container about said axis.

4,254,875

MAIL SORTING APPARATUS AND METHOD

Emery Varhelyi, 31 Penarth Rd., Bala Cynwyd, Pa. 19004

Filed Aug. 13, 1979, Ser. No. 66,169
Int. Cl.³ B42F 17/00; B61K 1/00
U.S. Cl. 209—547 **19 Claims**



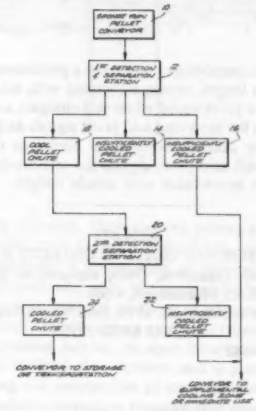
1. A sorting cabinet for mail matter comprising a base, partition means defining a plurality of pigeonholes, said pigeonholes being aligned in a series of rows on said base, one indicator means associated with each of said rows of pigeonholes, said indicator means comprising multiple sets of indicia means and shiftable support means on which said sets are supported, guide means positioning said indicator means adjacent its associated row of pigeonholes and means for simultaneously shifting said indicator means between multiple given positions corresponding in number to said sets, said indicia means indicating the mail matter to be placed in said pigeonholes, each set of indicia means being in registry with said pigeonholes when its associated indicator means is in one of said given positions.

4,254,876

METHOD AND APPARATUS FOR SEPARATING INSUFFICIENTLY COOLED METAL SPONGE PARTICLES FROM A MASS OF SUCH PARTICLES

Marco A. Flores-Verdugo, Monterrey; Leobardo Chapa-Martinez, San Nicholas de los Garza, and Juan F. Price-Falcon, Garza Garciz, all of Mexico, assignors to Hylsa, S.A., Monterrey, Mexico

Filed Apr. 23, 1979, Ser. No. 32,664
Int. Cl.³ B07C 5/00
U.S. Cl. 209—577 **13 Claims**



1. The method of separating a mass of insufficiently cooled sponge metal particles from a mass of cooled sponge metal particles discharged from the cooling zone of a sponge metal production plant to eliminate hot spots in said mass, which method comprises establishing a first path for conveying a body of said particles in bulk form from said cooling zone past an infrared detector to a separating station, said detector being responsive to infra-red radiation from insufficiently cooled particles in said body to generate a signal as said insufficiently cooled particles pass said detector, establishing a second path for conducting cooled particles in bulk form away from said separating station, establishing a third path for conducting insufficiently cooled particles in bulk form away from said separating station, normally guiding particles arriving at said separating station along said second path, and guiding the particles arriving at said separating station along said third path when said detector signals the presence of insufficiently cooled particles in said body.

4,254,877

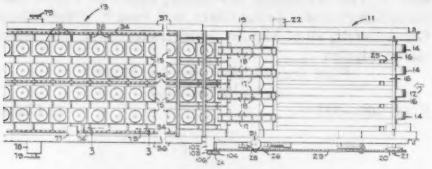
WEIGHT SIZING APPARATUS

Boyd W. Rose, Riverside, Calif., assignor to FMC Corporation, San Jose, Calif.

Filed Nov. 5, 1979, Ser. No. 91,321
Int. Cl.³ B07C 5/28
U.S. Cl. 209—594 **12 Claims**

1. In combination with apparatus for sorting articles of differing weight delivered thereto and for discharging each of the articles at a predetermined discharge station in accordance with article weight, and wherein said articles are arranged in single file on a conveyor having a continuous line of spaced article receiving cups, a plurality of spaced discharge stations therealong, scale means at the upstream end of the conveyor for weighing each of said cups with the article therein, and means at the discharge stations for selectively causing the cups

to discharge the articles carried thereby in accordance with the weights of the articles supported in the cups, wherein said scale means comprises an elongate pivot arm aligned with the line of spaced article receiving cups and positioned so that each of the article receiving cups is yieldably supported thereby in sequence along the length thereof so that an article in a receiving cup having a predetermined weight causes said elongate arm to



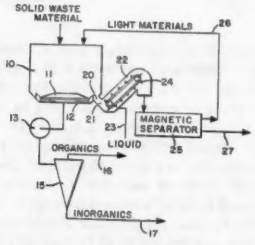
pivot when the receiving cup reaches a predetermined position along the arm length, means associated with said scale means for providing a pivot signal when said elongate arm pivots, and control means for receiving said pivot signals and for actuating said means for causing the cups to discharge the articles in accordance with said pivot signals for selectively discharging said articles in accordance with article weight.

4,254,878

SCREEN FOR SEPARATING OBJECTS BY SHAPE

Paul G. Marsh, Hamilton, Ohio, assignor to Black Clawson Fibreclaim Inc., Middletown, Ohio

Filed Aug. 22, 1979, Ser. No. 69,018
Int. Cl.³ B07B 13/05
U.S. Cl. 209—682 12 Claims



1. Apparatus for use in the processing of scrap to separate essentially flat-shaped pieces of a predetermined maximum dimension from a mass of pieces also including thin shapes of a greater maximum dimension and chunky shapes, comprising:

(a) conveyor means including a surface defining an extended path and means for effecting movement of said surface causing said mass to travel along said path with respect to said surface,

(b) a portion of said surface being provided with a plurality of generally rectangular openings arranged in spaced relation both lengthwise and cross-wise of said surface and with the upstream and down-stream edges thereof respectively substantially perpendicular to the length of said path and spaced from each other by a distance substantially equal to one-half said predetermined maximum dimension,

(c) each of said openings having a bottom wall which is stationary with respect to said surface and is inclined downwardly from the downstream edge thereof at a relatively small angle away from the direction of travel of said mass to define a slot-shaped hole between the lower edge of said wall and the upstream edge of said opening,

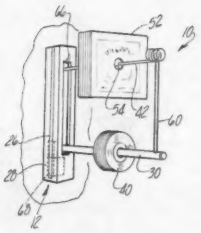
(d) whereby as a flat-shaped piece whose dimension along said path is less than twice the corresponding dimension of said opening travels across said opening, it will tilt backward when the trailing end thereof clears said upstream edge of said opening and slide down said bottom wall to said hole in the reverse direction from the travel of said mass.

4,254,879

PHONOGRAPH RECORD HOLDER WITH LOCKING MEANS

Warren Maule, 345 Ford St., Highland Park, Mich. 48203

Filed Aug. 9, 1978, Ser. No. 932,230
Int. Cl.³ A47F 7/00
U.S. Cl. 211—4 7 Claims



1. Apparatus for holding phonograph records, each record having a central aperture, said apparatus comprising:

an elongated support member and means for maintaining said support member in a vertical position;

a first elongated rod, said first rod having one end secured to said support member so that said rod extends substantially horizontally outwardly from said support member;

a second elongated rod, said second rod having one end secured to said support member so that said second rod extends substantially horizontally outwardly from said support member and in a spaced and parallel relationship to the first rod; and

means to prevent unauthorized access to phonograph records positioned over either of said rods comprising, a locking member and means for detachably connecting said locking member to the other ends of said first and second rods;

wherein the one end of the first rod is detachably connected to said support member and means formed on the other end of said first rod for detachable connection with the support member.

4,254,880

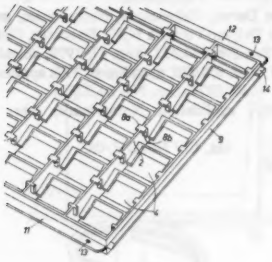
RACK FOR STORING OF SLIDES

Richard Mangel, Am Zollbret 1, Rheda-Wiedenbrück, Fed. Rep. of Germany

Filed Dec. 11, 1978, Ser. No. 967,951
Claims priority, application Fed. Rep. of Germany, Dec. 19, 1977, 2756558
Int. Cl.³ A47F 7/00
U.S. Cl. 211—41 6 Claims

1. A rack having a transverse front and rear for the individual storage of slides in compartments comprising a latticework of longitudinal and transverse ribs arranged on edge, adjacent pairs of longitudinal ribs being spaced from each other by a distance that corresponds to the width of a slide, adjacent pairs of transverse ribs being spaced from each other by a distance that is sufficient to establish an overlapping scale-like storage of the slides in longitudinal rows between the longitudinal ribs, the transverse ribs, each having respective heights that are not as great as the heights of the longitudinal ribs, the bottom surface of each compartment formed by adjacent pairs of longitudinal and transverse ribs being cut out to provide a narrow bottom ledge on the transverse ribs that are oriented toward the front in each of of the compartments, slide edges

being formed on the longitudinal ribs in each compartment, the slide edge being inclined from the upper edge of one of the transverse ribs downwardly and forwardly toward the bottom ledge of said compartment, an angular stop formed on at least



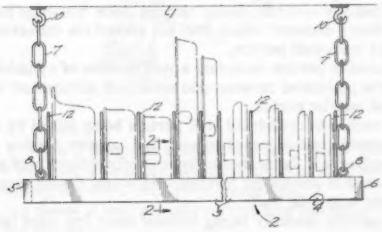
one of said longitudinal ribs in each of the compartments, each of the angular stops being open toward the respective transverse rib, from which the slide edge is inclined and the rack further having an outer contour that is provided with slide and grip ledges.

4,254,881

OVERHEAD KITCHEN UTENSIL RACK

Alfred B. Hard, 701 North Way, North Bend, Oreg. 97459

Filed Oct. 24, 1979, Ser. No. 87,872
Int. Cl.³ A47F *7/00*
U.S. Cl. 211—71 **5 Claims**



1. A rack for reception of kitchen utensils and storage of same in an overhead manner, said rack comprising,

a frame including an inner frame member and outer frame members,

means for suspending said frame from a ceiling, and

utensil support members carried by said inner and outer frame members and each utensil support member having an upright segment for juxtaposed disposition with a utensil to retain the utensil in rested engagement on said frame members in an upright position,

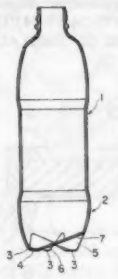
said support members further having at least one angulated end segment for engagement with a frame member to assure proper orientation of the support member to said frame members with the upright segment of the support member at all times supported in place by said angulated segment against tipping by a utensil.

4,254,882

PLASTIC PRESSURE BOTTLE

Yataro Yoshino, Tokyo, Japan, assignor to Yoshino Kogyosho Co., Ltd., Tokyo, Japan

Filed Aug. 9, 1979, Ser. No. 65,261
Claims priority, application Japan, Sep. 8, 1978, 53/123540
Int. Cl.³ B65D *1/02*
U.S. Cl. 215—1 C **14 Claims**



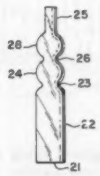
1. A biaxially oriented, blow-molded pressure bottle of a saturated polyester resin having a vertical axis, an outer wall, a bottom structure and a center point of intersection of said bottom structure with said vertical axis, said bottom structure comprising: an odd-numbered plurality of adjacent legs, each of said legs formed by truncating a generally trigonal, pyramidal shaped protrusion having an apex positioned below an open base, two inclined side surfaces and a portion of said outer wall, along the intersection of said side surfaces and a third surface radially extending through said center point to form a ridge surface and a tip at the intersection of said third surface with said outer wall, and each of said inclined side surfaces of each leg being attached to an inclined side surface of an adjacent leg to form a valley line of intersection.

4,254,883

AMPUL

Joseph J. Urban, Richboro, Pa., assignor to Hoechst-Roussel Pharmaceuticals Inc., Somerville, N.J.

Filed Jun. 22, 1979, Ser. No. 51,252
Int. Cl.³ B65D *1/02*
U.S. Cl. 215—32 **12 Claims**



1. An ampul comprising a hollow, tubular container composed of a reservoir chamber having a closed bottom contiguous with an upstanding wall portion terminating in a sealable open stem portion and including an unobstructed, spherical collecting chamber located between said reservoir chamber and said stem portion, the boundaries of said unobstructed, spherical collecting chamber defined by upper and lower neck-like constrictions of the circumference of said upstanding wall portion such that the width of said unobstructed, spherical collecting chamber is greater than the traverse width of said neck-like constrictions for trapping particulate matter formed by opening the ampul, said upper neck-like constriction being

pre-stressed to promote severance of the stem portion from the collecting chamber portion of said ampul.

4,254,884

PLUG BODY FOR A CONTAINER

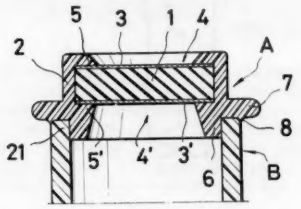
Takashi Maruyama, Urawa, Japan, assignor to Toppan Printing Co., Ltd., Japan

Filed Oct. 15, 1979, Ser. No. 84,560

Claims priority, application Japan, Oct. 20, 1978, 53-144204[U]; Sep. 21, 1979, 54-130943[U]

Int. Cl.³ B65D *41/20*

U.S. Cl. 215—232 **14 Claims**



1. A plug body for a plastic container receiving therein liquids such as blood, in which a rubber plug whose upper and lower surfaces are covered with thermoplastic films is positioned in the center of the plug body, and the rubber plug is outer peripherally provided with an injection molded portion with thermoplastic resin of the same quality as said plastic films said portion having inserting openings exposing the surfaces of said films.

4,254,885

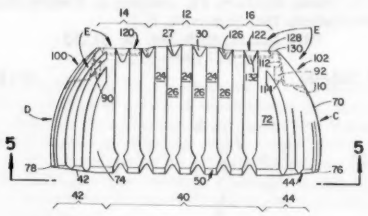
SUBTERRANEAN PLASTIC TANK

James L. Fouss; John J. Parker, both of Findlay, and Donald A. Lytle, Tiffin, all of Ohio, assignors to Hancor, Inc., Findlay, Ohio

Filed Feb. 14, 1979, Ser. No. 12,019

Int. Cl.³ B65D *6/38*

U.S. Cl. 220—72 **49 Claims**



1. A tank comprising:

a corrugated top wall elongated along a longitudinal axis and having an arched cross-section transverse to said longitudinal axis, said top wall including opposed side portions joined at an apex area;

A generally flat bottom wall elongated along the longitudinal axis and arranged to close the arched cross-section of the top wall, said top and bottom walls joined at side portion terminal side edge areas, whereby the top and bottom walls form a generally tubular structure;

opposed curvilinear end walls for closing end openings of the generally tubular structure, said end walls merging with said top wall along top wall end edge areas and joining said bottom wall along bottom wall end edge areas, said bottom wall end edge areas having a generally arched cross-section in a plane generally normal to the arched cross-section of the top wall; and

access means for allowing access to the interior of the tank.

4,254,886

CAN BODY HAVING A LATERALLY PROJECTING FLANGE

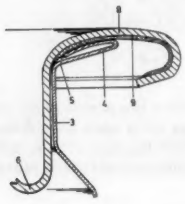
Hendrik D. Van Doren, Colmschate, Netherlands, assignor to Thomassen en Drijver-Verblifa N.V., Deventer, Netherlands

Continuation of Ser. No. 934,312, Aug. 17, 1978, abandoned, and Ser. No. 674,057, Apr. 5, 1976, abandoned. This application Apr. 18, 1979, Ser. No. 31,223

Claims priority, application Netherlands, Apr. 2, 1975, 7503926

Int. Cl.³ B65D *8/08*

U.S. Cl. 220—74 **7 Claims**



1. An unseamed can body comprising, in combination:

a main wall portion of cylindrical form and of thin, drawn sheet metal;

flange means at one end of said main wall portion for providing a radially outwardly double seamed joint with a lid while restricting the stress of the material of the flange means to a minimum during deformation thereof upon seaming the lid thereto, said flange means comprising a radially outwardly projecting first annular portion, a radially inwardly projecting second annular portion overlying said first annular portion, and an integral fold portion joining the peripheries of said first and second annular portions;

said second annular portion presenting a radially inwardly facing circular inner free edge spaced above said first annular portion;

said radially inwardly facing circular inner free edge presenting a diameter which does not exceed the diameter of said main wall portion,

a necked-in portion including a wall portion of cylindrical form positioned between said main wall portion and said first annular portion;

said necked-in cylindrical wall portion being joined by deformable radius means to said first annular portion for bending said flange means downwardly exteriorly of said necked-in portion for forming said lateral double seamed joint with a lid; and

said radially inwardly facing circular inner free edge being disposed adjacent said radius means.

4,254,887

STORAGE TANK

Stephen E. Bold, Ivor Heath, England, assignor to The British Petroleum Company Limited, London, England

Filed Mar. 6, 1979, Ser. No. 18,290

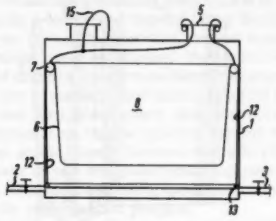
Claims priority, application United Kingdom, Mar. 15, 1978, 10201/78

Int. Cl.³ B65D *25/18, 90/01*

U.S. Cl. 220—85 B **16 Claims**

1. A liquid storage tank comprising a rigid shell having substantially vertical walls, a collapsible bag of impervious flexible sheet material positioned within the tank and dividing the interior or the rigid shell into an air space and a liquid space, peripherally disposed supporting means interiorly positioned around said vertical walls of the tank near the upper

peripheral portion of the bag for engaging and supporting the bag inside the tank and for maintaining the bag in spaced relation from the vertical walls of the tank, and a skirt attached to the external wall of the bag near the upper peripheral portion of the bag at the jointure point of the supporting means



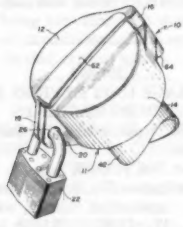
and the bag and positioned external to the bag and the supporting means so that the said skirt is interposed between the bag and the supporting means and the adjacent vertical walls of the tank, said skirt extending to a position near the base of the tank so that said skirt prevents said bag from contacting said adjacent vertical walls of the tank.

4,254,888

LOCKING GAS TANK CAP

James D. Chandler, 301 Ridgeview Dr., Wayzata, Minn. 55391

Filed Aug. 13, 1979, Ser. No. 66,309
Int. Cl.³ B65D *25/00, 54/14, 43/16*
U.S. Cl. 220—85 P **9 Claims**



1. A locking device in combination with a tank, having a spout and a cap detachably secured to the spout and removable by twisting the same, the device comprising:

a ring means at least partially surrounding and firmly engaging the spout;

a main body having first and second hinging portions hingedly connected with each other, said hinging portions having corresponding mating surfaces surrounding a depression whereby when the mating surfaces are in contact, the depressions form a cavity having an opening, said cavity being large enough to completely encompass the cap and the ring means secured to the spout, said hinging portions having radial inwardly extending flanges defining the opening to the cavity, said main body being free of said ring means but engaging the same when upward pressure is applied to the main body to prevent twisting of said cap by frictional engagement of the main body with the cap, and

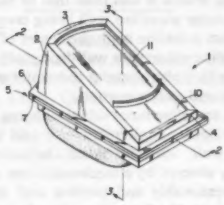
a locking means for securely holding the first and second hinging portions in a closed position that completely encompasses the cap and the ring means attached to the spout.

4,254,889

POP TOP CAN SEALER

Harvey B. Jacobs, 11607 Foxclove Rd., Reston, Va. 22091

Filed Dec. 11, 1979, Ser. No. 102,566
Int. Cl.³ B65D *53/00*
U.S. Cl. 220—234 **7 Claims**



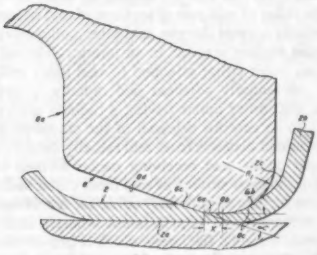
1. An inflated closure for use with a container having a planar end with a permanently formed aperature therein, comprising an inflated hermetically sealed elastic membrane having an annular flange, a housing having an upper body portion and a lower body portion, said lower body portion adapted to contact said container, said housing forming a chamber within which said membrane is disposed, said membrane, said upper body portion and said lower body portion all joined together through said annular flange, said upper body portion of said housing having at one end thereof an inturned continuous flange, an actuator plate of slightly less planar dimensions than said housing located between one surface of said membrane and said inturned flange, and locking means located on said upper body portion within said chamber whereby a container can be resealed by applying downward force to said actuator which everts said membrane from said housing into the cavity within said container and by horizontal motion of said actuator, said locking mechanism is engaged to maintain said actuator in the downward position.

4,254,890

NON-SLIVER SCORED METAL END

Teddy M. Westphal, Glencoe, Mo., assignor to Boise Cascade Corporation, Boise, Id.

Filed Aug. 27, 1979, Ser. No. 70,170
Int. Cl.³ B65D *17/40, 17/42, 17/32*
U.S. Cl. 220—276 **2 Claims**



1. A non-sliver scored metal end closure member for composite containers and the like, comprising

(a) a unitary metal end closure member including

(1) a horizontal central panel portion;

(2) an annular vertically arranged chuck wall portion; and

(3) an annular curved radius portion connecting the lower end of said chuck wall portion with the outer circumferential edge of said panel portion;

(b) one of the horizontal upper and lower surfaces of said

end closure member being planar and the other containing between said radius and panel portions a continuous scoreline including, in cross-sectional profile,

(1) a horizontal central flat bottom wall; and

(2) inner and outer side walls each diverging outwardly from said bottom wall,

(a) said outer scoreline wall being concave and having a radius which is less than that of said radius portion, said outer scoreline wall being tangent with said flat bottom scoreline wall, the center of the radius of said scoreline outer side wall being adjacent the vertical line which also contains the center of the radius of the metal end radius portion,

(b) said scoreline inner side wall being flat and arranged at an obtuse angle relative to said scoreline flat bottom wall, whereby when the scoreline is progressively severed by a mechanical can opener to remove the removable end portion and thereby open the container, the formation of undesirable metal slivers from the end is minimized.

4,254,891

STACKABLE COVER MEMBER FOR A CONTAINER

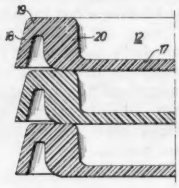
Jan-Bertil Jeppsson, Lomma, Sweden, assignor to AB Akerlund & Rausing, Sweden

Continuation of Ser. No. 964,274, Nov. 28, 1978, abandoned. This application Jun. 9, 1980, Ser. No. 157,811

Claims priority, application Sweden, Dec. 1, 1977, 7713670

Int. Cl.³ B65D *21/02, 43/03, 43/06*

U.S. Cl. 270—359 **10 Claims**



1. In a closure for a container, said closure including a central lid portion having a pair of substantially planar surfaces arranged generally opposite each other, one of said pair of surfaces facing an interior chamber of the container, and a peripheral rim portion surrounding said central lid portion, said peripheral rim portion having an inner collar extending from the other of said pair of surfaces of said central lid portion substantially normal thereto, said inner collar having a radially outermost surface sealable to an interior sidewall of the container, an outer collar attached to said inner collar and positioned substantially adjacent said radially outermost surface thereof, said outer collar having a radially innermost surface sealable to an exterior sidewall of the container and spaced a predetermined distance from said radially outermost surface of said inner collar, and receiving means formed between said radially outermost surface of said inner collar and said radially innermost surface of said outer collar for receiving an end edge of the container, the improvement wherein said inner collar has a predetermined thickness which is greater than the thickness of said outer collar and said central lid portion, said predetermined thickness of said inner collar being selected so that forces originating in the interior chamber of the container and acting on said one surface of said central lid portion in a direction substantially normal thereto are applied to an internal seal formed between said radially outermost surface of said inner collar and the interior sidewall of the container as shear forces, rather than as a torque, whereby the integrity of the internal seal may be more readily maintained without substantially increasing the amount of material required to make said closure.

4,254,892

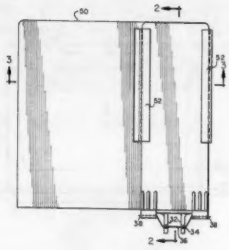
VENDING MACHINE SHELF WIDENERS

Stuart A. Lee, 715 N. Morton Ave., Morton, Pa. 19070

Filed Aug. 6, 1979, Ser. No. 63,758

Int. Cl.³ G07F *11/06*

U.S. Cl. 221—90 **5 Claims**



1. In combination with a vending machine, of the type wherein the goods being sold are stored in a series of vertical columns, arranged so that the individual items of merchandise are placed, one above the other, on a series of locked pivoting shelves which are adapted, whenever a sale is made, to unlock and rotate one at a time, in series starting with the lowermost shelf so that the particular item sold is dropped down the column into a receiver from which the purchaser can remove it, adjustment means adapted to allow a shelf to accept items of merchandise wider than the width of the vertical column in which it is placed without changing the basic function or structure of said vending machine wherein said adjustment means comprises a flat, lightweight panel adapted to engage a shelf and fit over it so that the effective width of the shelf is increased to accomodate larger sized goods and further adapted to non-interferringly rotate with said shelf whenever it is activated by a sale.

4,254,893

ARTICLE STORAGE UNIT DEVICES FOR USE IN VENDING MACHINES

Ryohei Kondo, Isesaki, Japan, assignor to Sankyo Electric Co., Ltd., Gunma, Japan

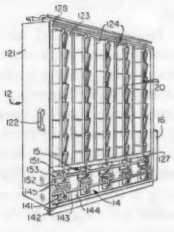
Continuation of Ser. No. 715,825, Aug. 19, 1976, Pat. No. 4,127,218. This application Sep. 8, 1978, Ser. No. 940,865

Claims priority, application Japan, Nov. 6, 1975, 50/152062[U]; Feb. 17, 1976, 51/15432; Mar. 22, 1976, 51/32874[U]

The portion of the term of this patent subsequent to Nov. 28, 1995, has been disclaimed.

Int. Cl.² B65G *59/10*

U.S. Cl. 221—124 **9 Claims**



1. An article storage unit device with means for discharging one article at a time for use in a vending machine, comprising;

a housing having a front plate, a side plate and a rear plate, and having a bottom opening, an interior of said housing being partitioned by partition walls into a plurality of

vertically extending spaces which are arranged along a horizontal direction from the front plate to the rear plate, said vertically extending spaces being for storing and stacking articles therein,

first plate means which is disposed along each of said vertically extending spaces at a position adjacent to said bottom opening on an opposite side of said side plate, said first plate means being rotatably supported at an upper end thereof with a lower end thereof being freely movable into and out of the corresponding vertical space,

first cam means being so disposed that a peripheral cam contour of said first cam means directly engages with an outer surface of said first plate means, said first cam means pushing said first plate means into the corresponding vertical space at an angular position thereof to hold the lowermost article therein between said side plate and an inner surface of said first plate means and permitting said first plate means to move out of the corresponding vertical space at the other angular position,

second plate means which is disposed above said first plate means and for holding an article adjacent to and above said lowermost article, said second plate means being rotatably supported at an upper end thereof with a lower end thereof being freely movable into and out of the corresponding vertical space,

second cam means being so disposed that a peripheral cam contour of said second cam means directly engages with an outer surface of said second plate means, said second cam means pushing said second plate means into the corresponding vertical space at an angular position thereof to hold the article adjacent to and above the lowermost article between said side plate and an inner surface of said second plate means and permitting said second plate means to move out of the corresponding vertical space at the other angular position, and said second cam means being in a different angular relation with said first cam means so that said second cam means is at the pushing angular position when said first cam means is at the other angular position, and

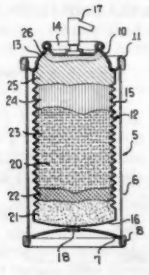
said side plate being provided with depressions in an inner surface thereof at positions against upper edges of lowermost articles in said vertical spaces.

4,254,894

APPARATUS FOR DISPENSING A STRIPED PRODUCT AND METHOD OF PRODUCING THE STRIPED PRODUCT

Thomas T. Fetters, Lombard, Ill., assignor to The Continental Group, Inc., New York, N.Y.

Filed Aug. 23, 1979, Ser. No. 69,147
Int. Cl.³ B65D *35/28*
U.S. Cl. 222—1 **8 Claims**



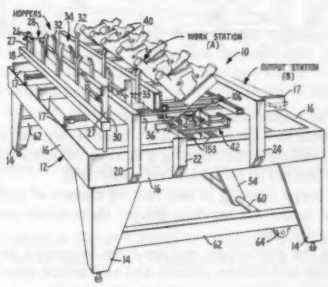
1. An apparatus for dispensing a striped product, said apparatus comprising a rigid container, a collapsible bag mounted within said rigid container, a dispensing valve carried by said rigid container in communication with the interior of said collapsible bag for dispensing the contents thereof, a product in said collapsible bag, and a gas in said rigid container around said collapsible bag for exerting a collapsing pressure on said collapsible bag to force said product towards said dispensing valve; the improvement residing in said product being arranged in said collapsible bag in distinct transversely extending axial layers, there being a single outlet passage between said collapsible bag and said dispensing valve and said collapsible bag being collapsible primarily in an axial direction.

4,254,895

APPARATUS FOR AUTOMATIC ALIGNMENT AND ATTACHMENT OF A DOORJAMB AND STOP

Edward G. Cheak, Chico, Calif., assignor to Norfield Manufacturing Co., Chico, Calif.

Filed May 30, 1979, Ser. No. 43,859
Int. Cl.³ B27F *7/02*
U.S. Cl. 227—50 **14 Claims**



1. Apparatus for automatically registering and attaching a doorstop of a first length to a doorjamb of a second length, comprising:

a frame having means thereon for defining an elongate work station including a plurality of nail-dispensing means connected to said frame proximate said work station, said nail-dispensing means being relatively located in linear, spaced-apart fashion along said work station;

a first hopper mounted to said frame for containing a stack of doorjambs;

a second hopper mounted to said frame proximate said first hopper for containing a stack of doorstops;

transport means mounted on said frame for reciprocal movement between a first position proximate said first hopper, a second position proximate said second hopper, and a third position proximate said work station, said transport means including means for withdrawing one of said doorjambs and one of said doorstops from said first and second hoppers, respectively, when said transport means is positioned in said first and second positions, respectively, and for transporting said withdrawn doorstop and doorjamb to said work station when said transport means moves to said third position;

said transport means including a plurality of parallel, spaced, elongate arm members situated in generally underlying, transverse relation to said first and second hoppers and mounted for longitudinal movement between said first, second and third positions, each of said arm elements including an edge adapted to be moved into adjacent, confronting relation with said first and second hoppers when said bar elements are moved to said first and second positions, respectively, said edge having formed therein a stop-receiving slot, each of the slots being aligned relative to the other of said slots for receiving a doorstop; and

means mounted to said frame proximate said work station for aligning and clamping said withdrawn doorstop and doorjamb in relative longitudinal relation and for holding

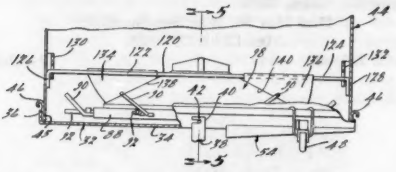
said withdrawn doorstop and doorjamb during attachment thereof.

4,254,896

ICE DISPENSING MACHINE HAVING AN AGITATOR AND A FIXED DEFLECTOR

Ralph F. Stanford, and Donald R. Christensen, both of Albert Lea, Minn., assignors to King-Seeley Thermos Co., Prospect Heights, Ill.

Filed Jul. 3, 1978, Ser. No. 921,837
Int. Cl.³ B65G *65/48*
U.S. Cl. 222—108 **20 Claims**



1. In an article dispensing apparatus,
an article storage area having a bottom closure portion and upstanding walls defining a storage chamber from which articles are to be selectively dispensed,
a discharge opening in said bottom closure of said chamber and means for moving articles therewithin toward said opening, and
means for preventing articles from becoming jammed between said bottom closure and said article moving means as said articles move toward said opening,
said jam prevention means including discharge chute means disposed below said opening and including a ramp portion inclined upwardly in the direction in which articles are moved toward said opening by said article moving means,
said discharge chute means further comprising an end section extending downwardly adjacent one peripheral edge portion of said discharge opening, with said ramp portion extending upwardly from the lowermost part of said end section to a position adjacent the peripheral edge portion of said opening opposite said one peripheral edge portion thereof.

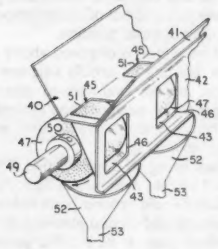
4,254,897

SEED AND FERTILIZER METERING MECHANISM FOR AGRICULTURAL DRILLING MACHINES

Richard A. Stocks, Holbeach, England, assignor to Hestair Bettinson Limited, Cambridgeshire, England

Continuation of Ser. No. 790,607, Apr. 25, 1977, abandoned, which is a continuation of Ser. No. 617,797, Sep. 29, 1975, abandoned. This application Feb. 26, 1979, Ser. No. 15,012
Claims priority, application United Kingdom, Sep. 27, 1974, 42023/74
Int. Cl.³ B67D *5/38*
U.S. Cl. 222—159 **2 Claims**

1. An agricultural drilling machine comprising:
a hopper for seed and/or fertilizer, said hopper having downwardly-converging front and rear walls and a bottom portion which defines a plurality of exit openings spaced from one another lengthwise of said hopper through which seed or fertilizer to be drilled by said machine can flow;
a plurality of metering mechanisms, one for each of said exit openings respectively, to provide a metered flow of seed or fertilizer from said hopper through each of said exit openings; and
collecting cups and associated conduits positioned below said plurality of metering mechanisms to receive each of said metered flows of seed or fertilizer and to deliver said metered flows to the ground prepared by said soil-working members;
each of said metering mechanisms comprising:
a rotatable metering roller connectable to a drive and mounted below its respective exit opening of said hopper, said metering roller having a compressible surface portion;
a flat glass metering plate; and
a holder for said metering plate connected to the front side of said hopper and extending generally vertically from said hopper to a position below said respective exit opening, said glass metering plate being fixed to said holder in a substantially vertical attitude adjacent to the compressible surface of its respective metering roller at a position forward of and below its said respective exit



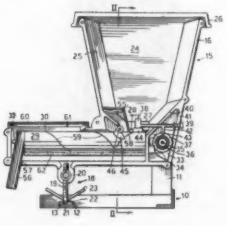
opening of said hopper, and said glass metering plate being positioned in substantially tangential relation to and bearing against the compressible surface of its respective metering roller so as to define therewith a downwardly tapering nip having unobstructed communication with said hopper through said exit opening, the direction of rotation of said metering roller by said drive during use being such that seed or fertilizer in said nip is fed by said metering roller through said nip and past said glass metering plate for discharge downwardly to said collecting cups and conduits while said glass metering plate permits visual monitoring from the front side of said hopper through said glass metering plate of the flow of speed or fertilizer between the said glass metering plate and its respective metering roller.

4,254,898

PARTICLE SPACING AND METERING DEVICE

John G. Davis, Macalister, Australia, assignor to Owen Michael Davis, Macalister and Henry Lincoln Davis, Toowomba, both of, Australia

Filed Dec. 3, 1979, Ser. No. 99,828
Int. Cl.³ G01F *11/00*
U.S. Cl. 222—263 **7 Claims**



1. A particle spacing and metering device including:
a supply hopper;
a floor in the hopper;
an aperture in the floor;

at least two contra-rotating rollers underlying the aperture and sealably engaging the underside of the floor;

a shaft rotatably mounted in aperture;

a regulator fixedly mounted on the shaft, said regulator being configured to closely overlie the valley formed between the rollers in a first position;

a throat formed by the rollers and the regulator, the regulator being movable to vary the size of the throat and the flow of particles therethrough;

wherein the improvement comprises:

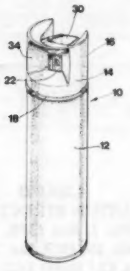
the regulator having a groove of simultaneously increasing depth and width along the regulator adapted to allow an increasing quantity of particles to flow through the aperture onto the rollers as the regulator is rotated from a first position where said throat is of minimum size to a second position where said throat is of maximum size.

4,254,899

SELF-ALIGNING AEROSOL DISPENSING DEVICE

Klaas J. van Lit, Amstelveen, Netherlands, assignor to S. C. Johnson & Son, Inc., Racine, Wis.

Filed Oct. 22, 1979, Ser. No. 87,195
Int. Cl.³ B65D *83/14*
U.S. Cl. 222—402.13 **9 Claims**



1. A self-aligning overcap and button device for an aerosol container comprising:

a button having a recessed upper surface, and a substantially cylindrical wall surrounding the recessed upper surface and defining an axis, said upper surface defining a well adjacent to the wall and including two helical ramps extending from the well upwardly in opposite directions along the wall to meet in a substantially radial edge, said well and said edge being in diametrically opposite positions, and

an overcap with an actuator tab having a pointed alignment pin extending therefrom substantially parallel to the axis and in position for engagement with said ramps and dimensioned for free insertion into said well,

whereby the overcap, when placed on the button, will rotationally align itself with respect to the button under the force of gravity.

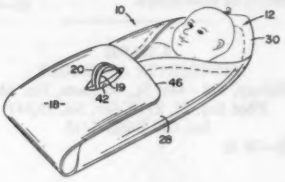
4,254,900

BABY LIFT CARRIER AND PAD ASSEMBLY

Ralph Wheeler, 12380 NW. 30 Place, Sunrise, Fla. 33323

Filed Jan. 30, 1980, Ser. No. 116,749
Int. Cl.³ A47D *13/02*
U.S. Cl. 224—158 **9 Claims**

1. A baby lift, and pad assembly of the type primarily designed to be used with infants, said assembly comprising: an inter and an outer surface, base means dimensioned and configured for support of the inant and structure for disposition in at least partially covering relation to the infant, handle means comprising at least one handle element projecting outwardly from each of both spaced apart and oppositely disposed lateral edges, a tail portion attached to and extending from one distal end of said base means, said handle restraining means attached to said tail portion and disposed and configured to engage said handle elements when said tail portion is disposed in its folded over position and when said handle elements are adjacent positioned relative to one another, said handle restraining means comprises an aperture means formed in said tail portion and dimensioned and structured to at least partially surround said handle elements, said handle elements thereby disposed



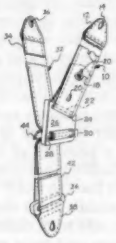
for gripping when protruding through said aperture means, said base means and said tail portion formed from a flexible material and said tail portion disposable in a folded over position back about a portion of the longitudinal axis of said assembly into at least partially overlapping relation to said base means and in retaining position with said handle means, whereby an infant may be maintained in at least partially covered position on said inter surface of said base means.

4,254,901

DOUBLE SHOULDERED GUITAR STRAP

Hugh C. McIntosh, 4338 Coronado Ave., San Diego, Calif. 92107

Filed Sep. 7, 1979, Ser. No. 73,421
Int. Cl.³ A45F *5/00*
U.S. Cl. 224—258 **2 Claims**



1. A two-shouldered strap for supporting a load suspended frontally of the user comprising:

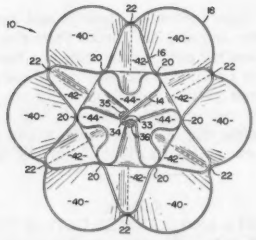
(a) a planar bracket positioned behind the back of the user and having a first connector comprised by an elongated void adjacent one edge of said bracket and a second connector comprising a bar divided by two parallel elongated slots in said bracket;

(b) a first strap connected to said first connector and extending forwardly over the right shoulder of the user and having attachment means on the end thereof for connection to said load;

(c) a second strap having a left portion to extend over the left shoulder of the user into one of the slots and out of the other of said slots around the second mentioned bar, and a right portion to extend from said second connector down around the right side of the user, and a return portion continuing from said right portion back up through said second connector flush against the medially portion in said second connector, said second strap having an end terminating on the side of said second connector remote from said right portion, whereby upon pulling said end

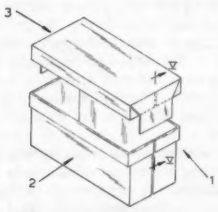
singly through said second connector the right portion of said second strap is length-adjusted, and upon pulling both said medially and return strap portions simultaneously through said second connector the position of said bracket on said second strap is adjusted, with both ends of said second strap having means of attaching same to said load, whereby said load is evenly borne by both shoulders of the user and steadied against lateral instability and a single bracket with no moving parts can make all necessary adjustments of both straps.

4,254,902
CONTAINER ASSEMBLY
Ruby D. Whitney, 672 - 41st St., Sarasota, Fla. 33580
Filed Sep. 27, 1979, Ser. No. 79,347
Int. Cl.[3] B65D *5/48*
U.S. Cl. 229—28 R **1 Claim**



1. A container assembly primarily designed to hold comestible objects for display and access, said container assembly comprising: base means including a plurality of sheet elements disposed in interconnected, stacked array and having a common central axis, each sheet element including a plurality of segments, attaching means comprising seam elements secured in interconnecting relation between any two next adjacent sheet elements, said plurality of segments each at least partially defined by two spaced apart of said seam elements disposed to extend generally from the outer periphery of the base means toward said central axis, connector means mounted on the outermost of said sheet elements and disposable in connected relation to one another to define an open position, said open position defined by a plurality of formed and open pockets disposed in object holding position, said plurality of sheet elements comprises at least an outer sheet, an under sheet, and a middle sheet, said middle sheet disposed between said inner sheet and outer sheet, said seam elements disposed in innerconnected relation between said outer and middle sheets and said under and middle sheets in offset relation to one another to define said plurality of pockets, said plurality of the seam elements comprises a first group of seams secured and disposed diametrically to said under sheet in innerconnected relation to said middle sheet and defining a plurality of segments on the exposed surface of said under sheet, each segment disposed between two radial portions of said diametrically disposed seams, said plurality of seam elements comprises a second group of seams radially disposed and secured to said outer sheet and innerconnected to said middle sheet, said second group of seams defining a segment between each two of said seams on said outer sheet, said plurality of pockets are defined by a first group of pockets disposed between said under and middle sheets and positioned in continuous end-to-end relation, each of said group of pockets at least partially defined and innerconnected by consecutive, spaced apart radial portions of said first group of seams, said plurality of pockets are defined by a second group of pockets disposed between said outer and middle sheets and positioned in continuous end-to-end relation, each of said second group of pockets at least partially defined and innerconnected by consecutive, spaced apart seams of said second group of seams, said plurality of pockets comprise a third group of pockets each defined by the exposed surface of said outer sheet element attached to itself by innerconnection of said connector means, said first, second and third groups of pockets are disposed in offset relation to one another and wherein each pocket of each group is opened in object receiving and storing position upon innerconnection of said connector means, said outer sheet comprises a plurality of segments disposed radially to one another, and each disposed between two next adjacent spaced apart seam elements, said container means comprising at least a first and second connector element disposed in an adjacent, side-by-side relation within the same segment and at least a third and fourth connector element, each of which are disposed in separate ones of said segments symmetrical relation to said first and second connector element said plurality of connector elements are structured for attachment to other ones of said connector elements, wherein said the innerconnection of respective connector elements define said open position of said container, said first and second connector elements are structured for attachment respectively to said third and fourth connector element, said third and fourth connector element each mounted in a segment spaced apart from one another and spaced apart from the segment in which said first and second connector elements are mounted.

4,254,903
CARTON STRUCTURE
Bert O. Kuehlhorn, Rte. 1, Box 134B, Lancaster, Va. 22503
Filed Oct. 10, 1979, Ser. No. 83,244
Int. Cl.[3] B65D *5/22, 5/64*
U.S. Cl. 229—45 R **19 Claims**



1. A covered box structure formed of sheet stock, comprising a box member and a cover member, the box member comprising a plurality of side walls and a bottom wall, the upper edges of the side walls having cuff portions integrally connected with and extending downwardly from the free upper edges of the side walls along the exterior faces thereof, said cuff portions extending along adjacent intersecting side walls of the box member integrally connected through each corner thereof, the cuff portions of two oppositely disposed side walls being divided intermediate their ends into two sections by respective slots, the cover member comprising a top cover wall and downwardly extending side walls, two oppositely directed side walls of said cover member having downwardly extending flaps which are inwardly and upwardly foldable and are formed of widths for spanning said respective slots, whereby they may be disposed between corresponding side walls and associated divided cuff portions of the box member and across said slots respectively for interlocking the cover member to the box member.

4,254,904
POCKET-TYPE SIEVE CENTRIFUGE

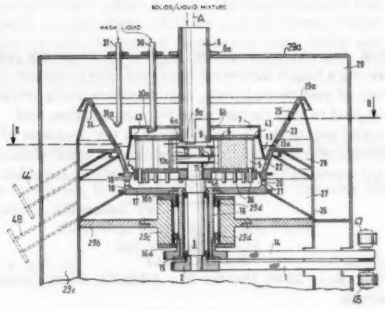
Peter Ostermeyer, Munich, and Günther Hultsch, Oberschleissheim, both of Fed. Rep. of Germany, assignors to Krauss-Maffei Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Aug. 7, 1979, Ser. No. 64,586

Claims priority, application Fed. Rep. of Germany, Aug. 7, 1978, 2834491

Int. Cl.³ B04B *3/00, 7/16*

U.S. Cl. 233—2 20 Claims



1. A centrifuge comprising:

a rotor rotatable about an axis;

an array of pockets carried on said rotor and centered on said axis, said pockets each having a radially inner region formed as a sieve and a radially outer region;

a flared skirt carried on said rotor, centered on said axis, surrounding said array of pockets, axially partially overlapping said array of pockets, and forming an annular space between said skirt and said sieves;

means for feeding a solids/liquid mixture into said rotor generally at said axis;

means for rotating said rotor and thereby centrifugally outwardly displacing said mixture over said sieves and across said space with concomitant filtering of at least part of the liquid phase of said mixture through said sieves;

means for extracting said liquid phase from behind said sieves as a primary filtrate;

an inwardly open channel carried on said rotor and having outlets opening axially into said space;

means including a stationary wash-liquid feed pipe opening radially into said channel for introducing a wash liquid into said channel and then passing said liquid through said outlets into said space to mix with the portion of said mixture being centrifugally projected across said space;

an outer flared drum rotatable about said axis independently of said rotor, spacedly surrounding said skirt, and having a wide-end edge; and

means for rotating said drum independently of said rotor and thereby displacing said portion of said mixture axially along said drum with at least the solid phase of said portion being projected centrifugally outwardly from said wide-end edge.

4,254,905
CENTRIFUGE ROTOR CONSTRUCTION

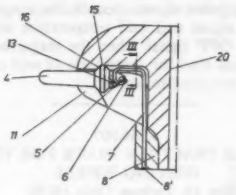
Jürgen Bäumler, and Gerhard Schröter, both of Osterode, Fed. Rep. of Germany, assignors to Heraeus Christ GmbH, Osterode, Fed. Rep. of Germany

Filed Apr. 3, 1979, Ser. No. 26,742

Claims priority, application Fed. Rep. of Germany, Apr. 5, 1978, 2814589

Int. Cl.³ B04B *9/12*

U.S. Cl. 233—26 10 Claims



1. In combination with a centrifuge to centrifuge substances retained in centrifuging cups (4),

a centrifuge rotor construction having

a rotor body (1);

elongated spring means (7, 67) rotating with the rotor and having

a first portion (9, 69) extending essentially horizontally and outwardly away from the axis of rotation; and

a hooked end (6) to receive engagement means (5) formed on the cups, the hooked end being positioned to permit the cups to hang vertically when the centrifuge is stopped and to swing outwardly under centrifugal force during operation of the centrifuge;

and means to secure the elongated springs to the rotor body comprising,

a holding portion (8, 68) positioned beneath the rotor body (1) and axially offset from the hooked end (6) of the spring means (7, 67);

a second portion formed on the spring means and extending essentially parallel to the axis of rotation of the centrifuge;

and bores (8') formed in the holding portion and extending essentially parallel to the axis of rotation (63) of the rotor body, the second portion of the spring means being located at least in part in said bores and held therein.

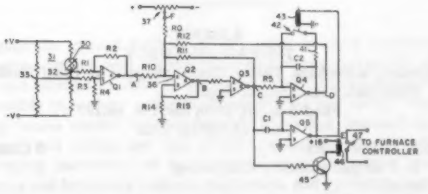
4,254,906
THERMOSTAT WITH SIMULATED HEAT ANTICIPATION

Thomas E. Hayes, Goshen, Ind., assignor to Johnson Controls, Inc., Milwaukee, Wis.

Filed Aug. 13, 1979, Ser. No. 66,485

Int. Cl.³ H01H *35/00;* G05D *15/00*

U.S. Cl. 236—78 D 16 Claims



1. Thermostat apparatus for generating an output signal for actuating a controller, comprising: temperature sensing circuit

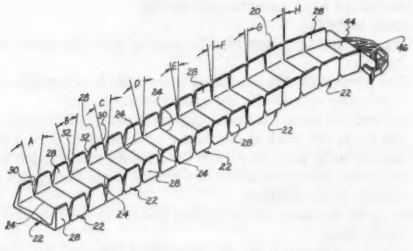
means generating an analog signal representative of temperature of a space to be affected by said controller; set point signal generator means for generating a set point signal representative of a desired temperature set point for said space; latching comparison means having first and second stable states and responsive to said temperature signal and said set point signal for generating said output signal in either an ON or an OFF state; first circuit means responsive to said output signal for generating a first signal increasing in magnitude with time and having a polarity to change the state of said output signal; said comparison means generating said ON signal when the magnitude of said set point signal exceeds the magnitude of said combined first signal and said temperature signal, and for generating said OFF signal when the magnitude of said set point signal is less than the magnitude of said combined first signal and said temperature signal.

4,254,907

PORTABLE TRACTION TRACK FOR VEHICLE DRIVING WHEEL

Danny R. Pine, Box 19, Tarlton, Ohio 43156

Filed Jun. 22, 1979, Ser. No. 50,984
Int. Cl.³ E01B *23/00*
U.S. Cl. 238—14 **7 Claims**



1. A portable traction track for the driving wheel of a vehicle disposed in a ground surface depression significantly greater than the surrounding ground surface level comprising, in combination, an elongate strip having a traction surface including a plurality of flexibly connected base sections; each of said base sections provided with opposing side wall means; said side wall means being provided with longitudinally spaced edges, each of said edges having a predetermined angular relationship with the edge of the side wall means associated with the immediately adjacent base section to define an increasing limitation of the degree of flexible movement of said base sections relative to one another in at least one direction for a given major portion of the length of said strip; releasable locking means provided between each of said side walls upon engagement between adjacent edges thereof to reinforce the limitation of the movement of said base sections; whereby said strip tends to form a decreasing degree of curvature relative to the configuration of said depression upon increasing the length of said strip inserted under said driving wheel within said depression.

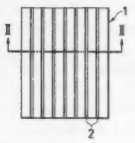
4,254,908

TIE-PAD ASSEMBLY

Kentaro Matsubara, Tokyo, Japan, assignor to Tokai Rubber Industries, Ltd., Komaki, Japan

Filed Aug. 20, 1979, Ser. No. 68,287
Int. Cl.³ E01B *9/68*
U.S. Cl. 238—283 **5 Claims**

1. A tie-pad assembly comprising:
a rail;
a tie;
a rectangular tie-pad plate made of relatively soft elastic rubber material, having a plurality of longitudinal grooves provided on upper and lower surfaces thereof and a first pair of cutaway portions formed in lower side edges thereof in the longitudinal direction of the rail, said tie-pad plate being disposed between the rail and the tie;
a first pair of reinforcement members made of relatively hard elastic rubber material, said members each being formed of an extending portion to be inserted into said



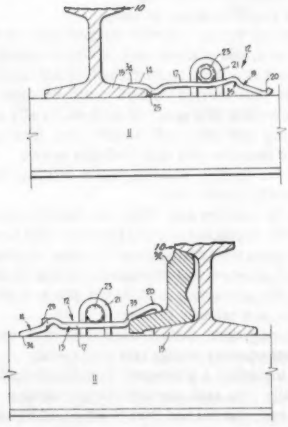
first cutaway portion and a pressure receiving portion having a height somewhat lower than the maximum thickness of said tie-pad plate, said members being integrally coupled to said tie-pad plate by vulcanization; and
an aerial gap having a depth less than the thickness of said members formed between and along the upper surfaces of said members and said tie-pad plate when assembled.

4,254,909

RAIL CLEAT

Albert E. Rex, 38-40 Halifax St., Adelaide, South Australia, Australia

Continuation of Ser. No. 801,063, May 27, 1977, abandoned, which is a continuation of Ser. No. 637,533, Dec. 4, 1975, abandoned. This application Sep. 15, 1978, Ser. No. 942,611
Claims priority, application Australia, Dec. 6, 1974, 9919/74; Mar. 3, 1975, 0758/75
Int. Cl.³ E01B *9/30*
U.S. Cl. 238—340 **7 Claims**



1. A resilient fastening system for fastening a rail to a sleeper, comprising:
(a) a pair of plates of spring steel each having a rail bearing end of shape to bear against a rail foot, an intermediate portion having walls defining an aperture and also forming shoulder engaging surfaces, and a bearing tail;
(b) a shoulder on each of the opposite sides of the rail foot extending upwardly from a sleeper, each shoulder having a wall defining an opening which extends in a direction

parallel to a rail when on the sleeper, each shoulder being at a location a distance away from the rail foot; and

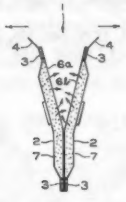
(c) a respective locking pin extending through each shoulder opening and caused by the wall thereof to bear downwardly against said intermediate portion applying a downward force at said rail bearing end against the rail foot (when engaging the rail foot) and also at said bearing tail against said sleeper, each said intermediate portion being above the sleeper and being strained downwardly by said locking pin, said shoulder engaging surfaces of each plate being contiguous with a respective one of said shoulders thereby locating said plate with respect to that shoulder, each spring steel plate having a depression extending along it constituting an edge locating formation on its rail bearing end, a face of each depression being in abutting relationship with the rail foot, so arranged that, when in abutment with opposite sides of said rail foot, said faces locate the rail with respect to the shoulders such that rail gauge is maintained solely by said abutment of said rail foot by said depression faces, each plate being non-flat between its shoulder and its rail engaging end thereby providing lateral resilience.

4,254,910

PACKAGE FOR THE CONTROLLED RELEASE OF VOLATILE SUBSTANCES

James P. Martin, Richmond, Va., assignor to Reynolds Metals Company, Richmond, Va.

Filed Oct. 11, 1979, Ser. No. 83,581
Int. Cl.³ A61L 9/04
U.S. Cl. 239—60 **10 Claims**



1. A package comprising a pair of substantially similar pockets each having a volatile substance therein, said package comprising a pair of outer vapor-impermeable layers and a central vapor-permeable layer bonded along edge regions thereof to each of said vapor-impermeable layers to form said pair of pockets, said volatile material being positioned in each pocket between said central vapor-permeable layer and each said outer vapor-impermeable layer, said central vapor-permeable layer comprising a pair of bonded together vapor-permeable webs, the bond strength between said vapor-permeable webs being less than the bond strength between said central vapor-permeable layer and said outer vapor-impermeable layers.

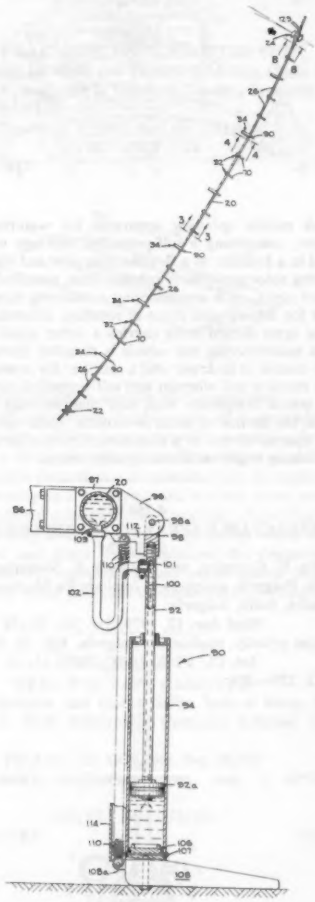
4,254,911

SELF-PROPELLED IRRIGATION SYSTEM

James M. Hait, 8047 Chardonay Ct., San Jose, Calif. 95135

Filed Oct. 12, 1978, Ser. No. 950,933
Int. Cl.³ B05B 3/00, 3/18
U.S. Cl. 239—177 **8 Claims**

1. In a self-propelled irrigation system for connection to a source of water for irrigating a relatively large area of land, said system comprising a length of tubing for carrying water, a plurality of irrigation outlets arranged in spaced relationship along said length of tubing for discharging water therefrom, means for connecting one end of said tubing to said source, means for supporting said tubing at spaced points along the length and for causing said tubing to traverse said area in a forward direction, timing means for periodically blocking the flow of water from said source of said tubing and for restoring the flow of water from said source to said tubing according to a predetermined time pattern, power means associated with at least some of said supporting means and operatively connected with the flow in said tubing for causing said supporting means to elongate in a direction transverse to said tubing to lift and push said tubing in the forward direction only during those alternate time intervals when flow is restored to said tubing whereby the tubing is caused to be intermittently moved in short increments, said power means comprising a single-acting hydraulic cylinder assembly, including a cylinder member and a piston member, one of such members being arranged to

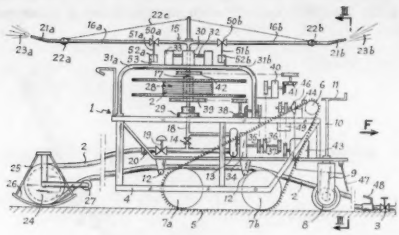


engage the ground surface and the other of such members having a pivotal connection said support means rearwardly of to said tubing to permit swinging movement of said cylinder assembly in a plane generally transverse to said tubing, and stop means carried by said support means and disposed between said tubing and said pnotal connection to preclude swinging movement of said cylinder assembly below said tubing and forwardly past said stop means, said cylinder assembly thereby constrained to pivot to the rear of the length of tubing only so that said length must be driven in the said forward direction.

4,254,912
MOBILE SPRAYING APPARATUS FOR WATERING CULTIVATED SURFACES

Henri V. Lebrun, Le Thuel, 02340 Montcornet, and Pierre A. Boutboul, 71, rue Liandier, 13008 Marseille, both of France

Filed Jun. 8, 1979, Ser. No. 46,642
Claims priority, application France, Jun. 9, 1978, 78 17849
Int. Cl.[3] A01G *25/09*
U.S. Cl. 239—183 10 Claims

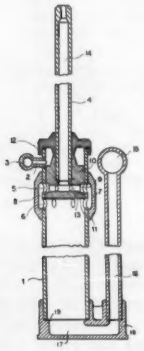


1. A mobile spraying apparatus for watering cultivated surfaces, comprising a self-propelled carriage which is connected to a hydrant by a flexible hose pipe and which carries a watering rotor comprising tubular arms, mounted on a hollow vertical pivot, each arm carrying a watering hose nozzle and means for driving said rotor in rotation, wherein each of the tubular arms of said rotor carries a valve which is provided with a manoeuvring rod which is directed downwardly and which carries at its lower end a member for manoeuvring said rod in rotation and wherein said self-propelled carriage carries stops which cooperate with said manoeuvring members so that, in the course of each revolution, each valve is successively opened by one stop then closed by another stop and said rotor waters solely within a circular sector.

4,254,913
RETRACTABLE SPRAY HEAD FOR IRRIGATION SYSTEM

Vesselin Y. Georgiev, and Vladimir S. Mednikarov, both of Sofia, Bulgaria, assignors to Institute Po Mechanika I Biomechanika, Sofia, Bulgaria

Filed Apr. 12, 1979, Ser. No. 29,476
Claims priority, application Bulgaria, Apr. 13, 1978, 39396
Int. Cl.[3] F16K *21/00*; B05B *15/10*
U.S. Cl. 239—204 4 Claims



1. A spray head for an irrigation system having first and second conduit means alternately supplied with water under pressure, comprising:

an underground housing including an upright cylinder and a base forming a chamber which communicates with said first conduit means and opens into the bottom of said cylinder;

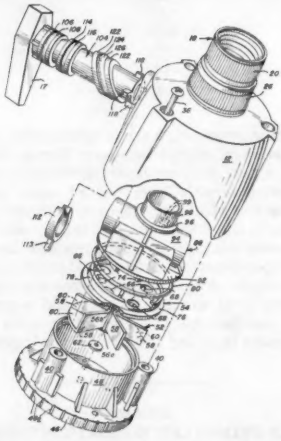
a piston reciprocable in said cylinder between a retracted and an extended position, said piston including a piston head on a lower end of a riser tube whose open upper end projects above ground in said extended position while being withdrawn in said retracted position, said piston head having a peripheral groove communicating with the lower end of said tube, said cylinder being provided near its top with a lateral port which communicates with said second conduit means and lies just above an upper surface of said piston head in said extended position of said piston, said cylinder further having at least one upper hole and at least one lower hole beneath the level of said port, said upper hole registering with said groove and said lower hole lying beneath the level of an undersurface of said piston head in said extended position; and

a fixed external connection between said upper and lower holes on said cylinder whereby water entering said chamber from said first conduit means, after elevating said piston into its extended position, passes into said tube via said lower hole, said connection, said upper hole and said groove for irrigating a surrounding area, said piston being withdrawable into its retracted position by water entering said port from said second conduit means.

4,254,914
PULSATING SHOWER HEAD

Sidney J. Shames, 57 Holly Pl., Briarcliff Manor, N.Y. 10510, and Harold Shames, 5 Agnes Cir., Ardsley, N.Y. 10502

Filed Sep. 14, 1979, Ser. No. 75,811
Int. Cl.[3] B05B *1/34*
U.S. Cl. 239—383 7 Claims



1. In a shower head having means for selectively discharging therefrom, alternatively, a shower spray from a first set of apertures or a pulsating shower spray from a second set of apertures, wherein the shower head includes an upstream axially elongated shell with a water inlet, a manually operable spray selector on the shell, a downstream housing as a part separate from the shell and from which water is discharged as said sprays, and diverter means between said shell and housing for selectively directing the discharging water either from the first or second set of apertures, the improvement comprising, in combination:

an axially-elongated diverter body, separate from said shell and downstream housing and positioned therebetween,

said diverter body being shaped to provide an elongated, radially extending, control sleeve open at both ends, said diverter body also defining axially extending and radially offset intake and outlet flow passageways which intersect said control sleeve;

an elongated diverter shaft pivotably mounted in said control sleeve with a portion of said shaft adjacent one end thereof extending radially through said shell to said manually operable spray selector seal means carried on said diverter shaft adjacent said one end and providing a rotary seal both between said shaft and the diverter body and between the shaft and the shell to prevent water leakage therepast, the other end of said diverter shaft being constructed to permit water flow therepast, and diverting seal means carried on said diverter shaft for sealing engagement with the wall of the control sleeve, and being shaped to direct flow from the intake flow passageway in the diverter body either radially outwardly from the control sleeve or to the outlet flow passageway in the diverter body upon selective rotation of the diverter shaft; and

said shell, diverter body, and downstream housing being shaped, constructed, and arranged to provide, alternatively, a first water flow path through the shower head communicating with said first set of apertures or a second flow path through the shower head communicating with said second set of apertures, depending on the position of the pivotable diverter shaft controlled by the spray selector.

4,254,915

FUEL INJECTOR FOR INTERNAL COMBUSTION ENGINES

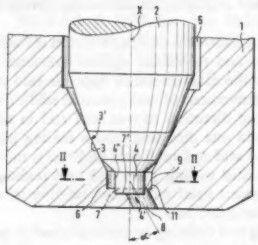
Eckart Müller, Schwabach, Fed. Rep. of Germany, assignor to Maschinenfabrik Augsburg-Nürnberg Aktiengesellschaft, Nuremberg, Fed Rep. of Germany

Filed Nov. 15, 1978, Ser. No. 960,831

Claims priority, application Fed. Rep. of Germany, Nov. 15, 1977, 2750929

Int. Cl.³ B05B *1/30*; F02M *61/00*

U.S. Cl. 239—533.12 **10 Claims**



7. A fuel injector for internal combustion engines, which comprises:

a nozzle body having a valve seat, a cavity which is substantially coaxial to the longitudinal axis of said nozzle body, a blind hole located at the base of and substantially coaxial with said cavity and having a smaller diameter than said cavity, and at least one spray hole which communicates with said blind hole and is also adapted to communicate with the combustion chamber of a cylinder of said engine, said at least one spray hole being eccentrically located in said nozzle body, relative to the longitudinal axis thereof, in such a way that a small portion of said spray hole, in the form of a clearance, also communicates with said cavity;

a nozzle needle which is axially displaceably arranged within said nozzle body and is provided with a conical valve seat which is adapted to rest against said valve seat of said nozzle body in a closed position of said fuel injector and is further adapted to be lifted off said valve seat of said nozzle body, in response to fuel pressure, into an opened position of said fuel injector; and

a pin forming a part of said nozzle needle and located on that side of said conical valve seat thereof which faces said cavity, said pin extending into said cavity and said blind hole when said fuel injector is in the closed and slightly opened positions to provide substantial sealing in a radial direction, said pin being cylindrical and having a planar free end face, and in which the base of said blind hole is also planar, the interface between said blind hole and said cavity resulting from the smaller diameter of said blind hole being oblique to the base of said blind hole and to the planar end face of said pin.

4,254,916

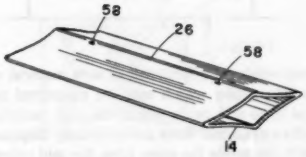
THIN WALL IRRIGATION EMITTER TUBE

Glenn G. Havens, La Mesa, and Thomas F. McGee, Chula Vista, both of Calif., assignors to Bayshore Creative Products, Inc., National City, Calif.

Filed Aug. 7, 1978, Ser. No. 931,374

Int. Cl.³ B05B *1/20*

U.S. Cl. 239—547 **1 Claim**



1. A thin wall irrigation emitter tube comprising:

an elongated continuous flexible tube of a generally flat configuration defined by upper and lower walls for conducting a fluid therealong and including a plurality of emitter ports formed in and spaced along the upper wall for dispensing said fluid from said emitter ports, and

a pair of opposed creases formed centrally of and extending longitudinally along the upper and lower walls of said tube, and said ports formed adjacent the crease in the upper wall for maintaining said ports spaced from the lower wall when said tube is rolled flat on a drum or the like.

4,254,917

REEL FOR TAPE CASSETTE

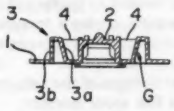
Masatoshi Okamura, and Haruo Shiba, both of Saku, Japan, assignors to TDK Electronics Company Limited, Tokyo, Japan

Filed Jul. 25, 1979, Ser. No. 60,731

Claims priority, application Japan, Aug. 2, 1978, 53-106525[U]

Int. Cl.³ B65H *75/18*

U.S. Cl. 242—68.5 **7 Claims**



1. A reel for a tape cassette, comprising:

a disk reel hub;

a cylindrical shaft on the hub for connection with a rotary driving shaft; and

a cylindrical magnetic tape winding core on the disk reel hub having a diameter larger than the shaft and comprising inner and outer radially spaced apart tubular walls

coaxial with the shaft, said walls being joined to one another at one end thereof only, and a plurality of radially extending reinforcing ribs extending between and joined to the shaft and inner wall, said outer wall being free of direct connection to the reinforcing ribs and therefore not subject to deformation during manufacture of the reel.

4,254,918

REMOVABLE CORE FOR REELED WEB MATERIAL

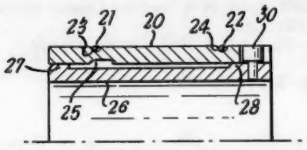
Peter N. Huggins, Brentwood, England, assignor to Ciba-Geigy AG, Basel, Switzerland

Filed Feb. 21, 1980, Ser. No. 123,228

Claims priority, application United Kingdom, Mar. 9, 1979, 8309/79

Int. Cl.³ B65H *17/02*

U.S. Cl. 242—68.5 **8 Claims**



1. A removable core for a roll of web material which comprises an outer tube which may be supported to assume a cylindrical form and on to which the web material is wound when in the cylindrical form and an axially displaceable insert piece which fits inside the outer tube, the said outer tube being split lengthways into at least two sections which are biased towards each other by expandable binding means, the outer tube being supported in the cylindrical form by the presence of the insert piece therein.

4,254,919

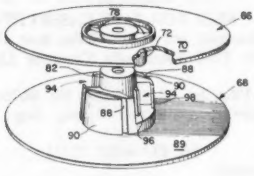
METHOD OF LOADING FILM CASSETTE

Donald E. Moodie, Marblehead, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Division of Ser. No. 45,272, Jun. 4, 1979. This application May 12, 1980, Ser. No. 148,666

Int. Cl.³ B65H *75/28*

U.S. Cl. 242—71.8 **2 Claims**



1. In a method of loading an unexposed strip of photographic film into a film cassette having a spool spindle for rotatably mounting a two-piece spool having separable first and second members comprising the steps of:

(a) winding convolutions of the unexposed film strip upon the hub of the first spool member;

(b) releasably attaching a film cover to the hub of the first spool member for substantially encapsulating the film so that the film does not become fogged due to light leakage;

(c) mounting the film cover and the first spool member on the support spindle;

(d) threading the film in the cassette by drawing the film through a slot in the cover;

(e) removing the film cover from the first spool member in darkness or in subdued low light while such first spool member is still mounted on the spindle, and

(f) joining the second spool piece to the first spool piece while the latter is on the spindle.

4,254,920

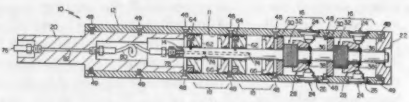
AIR SHAFT

Bruce E. Peterson, Acushnet, Mass., assignor to Double E Company, Inc., Brockton, Mass.

Filed Jun. 19, 1978, Ser. No. 916,841

Int. Cl.³ B65H *75/18, 75/24*

U.S. Cl. 242—72.1 **18 Claims**



1. An expansible shaft comprising:

a hollow axially-extending cylindrical body;

a core engaging section within said body;

a retracting section within said body and spaced axially of said core engaging section; and,

an operating rod extending generally coaxially of said body and coupling said core engaging and said retracting sections,

said core engaging section including a plurality of circumferentially-spaced core engagers each movable radially relative to said body between a core engagement position in which it projects beyond the cylindrical wall of said body and a withdrawn position radially inwardly of said core engagement position thereof, a cam mounted on said rod and having a camming surface engaging said core engagers, a spring mounted coaxially of said rod and engaging said cam and biasing said cam in one axial direction such that said camming surface urges said core engagers towards said core engagement positions thereof, and a stop within said body restrained against movement relative to said body in the axial direction opposite said one direction and engaging the end of said spring opposite said cam,

said retracting section including a piston mounted coaxially of said rod and restrained against movement relative to said rod in the axial direction opposite said one direction such that movement of said piston in said direction opposite said one direction moves said rod in said direction opposite said one direction, and a sealing plate mounted coaxially of said rod such that said rod is movable axially relative to said sealing plate and said sealing plate is restrained against axial movement relative to said body in said one direction, and

said operating rod defining an internal conduit providing for flow of fluid under pressure to a port axially intermediate the piston and sealing plate of said retracting section, said rod being coupled to said piston and said cam such that said fluid under pressure forces said piston in said axial direction opposite said one direction against the bias of said spring of said core engaging section thereby moving said rod and said cam in said direction opposite said one direction.

4,254,921

WINDING SHAFT FOR A BELT ROLL-UP DEVICE FOR WINDING AND UNWINDING A VEHICLE SAFETY BELT

Heinz-Dieter Adomeit, Berlin, Fed. Rep. of Germany, assignor to Repa Feinstanzwerk GmbH, Alfdorf, Fed. Rep. of Germany

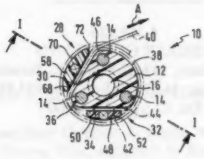
Filed Dec. 18, 1978, Ser. No. 970,569

Int. Cl.³ A62B *35/02*; B65H *75/48*

U.S. Cl. 242—107.4 C **8 Claims**

1. A winding shaft in a belt roll-up device for winding and unwinding a vehicle safety belt, in which the winding shaft can

rotate in a belt roll-up housing for winding and unwinding the belt, a locking element connected to the winding shaft, a blocking element fastened to the housing, the locking element coming into engagement with the blocking element by a force in the direction of the belt pull exerted upon the winding shaft, the improvement comprising means for fastening the end of the belt to the winding shaft, and means for engaging the surface of the belt at approximately 530° of turns of belt for exerting a force on the winding shaft for making the locking element respond when the last approximately 1.5 turns begin to be unwound from the winding shaft thereby engaging the blocking element and preventing the last approximately 1.5 turns of belt from unwinding, and wherein the means for engaging the surface of the belt for exerting a force on the winding shaft comprises a circle-segment-shaped cross piece which is brought into connection with the winding shaft after about 530° of turns of the belt from the belt end around the winding shaft, with the flat surface of the cross piece in engagement with the surface of the belt, and wherein the winding shaft is flattened in the region in which the cross piece is arranged, by a segment of a circle in such a manner that the circular shape is completed by two layers of belt and the cross piece, after the cross piece is attached.



4,254,922

TAPE CASSETTE

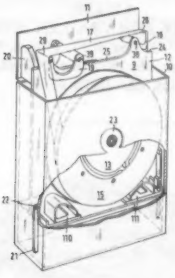
Theo Wolf, Rossdorf; Dieter Gause, Weiterstadt; Hans-D. Schneider, Gross Gerau, and Peter Gunschmann, Darmstadt, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Feb. 9, 1979, Ser. No. 10,816

Claims priority, application Fed. Rep. of Germany, Feb. 21, 1978, 2807271; Sep. 27, 1978, 2841993

Int. Cl.³ G03B *1/04;* G11B *15/32*

U.S. Cl. 242—194 **42 Claims**



1. A tape cassette comprising

a housing (**10, 210**) of substantially parallelepiped shape having two narrow sides;

a separating wall (**12, 221**) disposed movably within said housing, said separating wall dividing said housing into two internal chambers;

support means for holding a tape reel rotatably on each of the opposite sides of said separating walls;

a movable cover (**211**) positioned on the housing at a narrow side thereof to selectively provide access to the interior of the housing;

locking means (**231**) securing and locking said separating wall (**221**) in position within said housing;

and a locking mechanism (**215, 216**) locking the cover (**211**) in closed position in the housing,

said locking mechanism being conjointly operable with said locking means for said separating wall to permit conjoint opening of the cover and unlocking said separating wall for movement with respect to said housing.

4,254,923

MAGNETIC TAPE CASSETTE

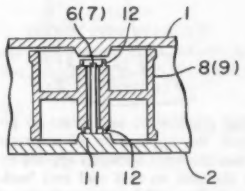
Toshihiko Ishida; Yukio Nakazawa, both of Komoro; Haruo Shiba, and Kimio Tanaka, both of Saku, all of Japan, assignors to TDK Electronics Company Limited, Tokyo, Japan

Filed Jul. 25, 1979, Ser. No. 60,728

Claims priority, application Japan, Aug. 2, 1978, 53/106524[U]

Int. Cl.³ B65H *17/20*

U.S. Cl. 242—199 **4 Claims**



1. A magnetic tape cassette, comprising:

a housing having half cases with aligned projections on confronting inner surfaces thereof, said projections each having a substantially flat guide roll bearing surface thereon;

a shaft projecting axially from the center of one of the projections toward the other projection;

a tape guide roll rotatably disposed on the shaft and having an axial bore therethrough;

said roll having substantially flat annular end surfaces of about the same diametrical size as the projection end surfaces; and

an annular, axially extending rib disposed between the projection end surface and the adjacent roll end surfaces, said rib being spaced radially outwardly from the axial bore through the roll, and defining a support for the roll, whereby any burrs on the roll around the axial bore are prevented from coming into contact with the projection on the housing.

4,254,924

AIRCRAFT SEAT

Edward J. Brennan, Litchfield, Conn., assignor to Koehler-Dayton, Inc., New Britain, Conn.

Filed May 25, 1979, Ser. No. 42,341

Int. Cl.³ B64D *11/06*

U.S. Cl. 244—122 R **2 Claims**

1. A seat for a vehicle comprising:

a seat bottom,

a seat back mounted on said seat bottom for pivotal movement relative thereto,

means for pivotally locating said seat back at an upright sitting position including

linkage means mounted at one end on said seat bottom for pivotal movement relative thereto,

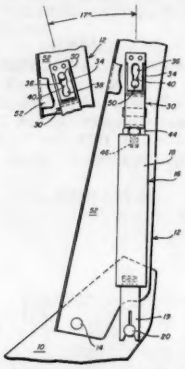
a pin member secured to said seat back,

said linkage means having at a second end block means

having a first aperture defined therein for receiving and containing said pin member,

means for pivotally locating said seat back at a forward dress-up position where said seat back interferes with the occupation of said seat thereby enlarging the living space of the next rearward seat including said block means having a second vertically upwardly spaced aperture for receiving and containing said pin member, and

means for permitting the relocation of said seat back from



said sitting position to said dress-up position and vice versa upon the application of a predetermined force smaller than the force normally applied by a person sitting down in the seat so that said seat back located at the dress-up position will be automatically relocated to said sitting position by a person sitting in said seat including

said block means having a channel interconnecting said first and second apertures having a selected width smaller than said pin member for preventing the relocation of the seat back until the predetermined small force has been applied.

4,254,925

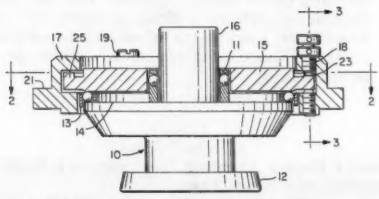
THEODOLITE CENTER MOUNTING MEANS

J. Peter E. Kooi, Loudonville, N.Y., assignor to Keuffel & Esser Company, Morristown, N.J.

Filed Aug. 20, 1979, Ser. No. 67,981

Int. Cl.³ F16M *11/12*

U.S. Cl. 248—180 **9 Claims**



1. Means for conjointly mounting in facing relation a pair of generally planar members of different coefficient of expansion, said means comprising:

(a) a plurality of straight groove elements disposed on a planar face of the first of said members about an axis perpendicular to said face, said groove elements being oriented with their longitudinal axes coincident with different radii centered upon said perpendicular axis;

(b) a plurality of support elements of substantially equal length extending from the opposing planar face of the other of said members, said support elements having distal ends conforming to the cross-sectional shape of said groove elements and being so located as to seat respectively in different ones of said groove elements in a near perfect fit; and

(c) means maintaining contact between said groove elements and said support element distal ends, yet allowing sliding movement between the contacting faces of said elements, whereby planar movement between said members during expansion or contaction of said members occasioned by changes in temperature is constrained by the contacting groove and support elements to directions along said radially-extending longitudinal groove axes, thereby maintaining said planar members in concentricity about said perpendicular axis.

4,254,926

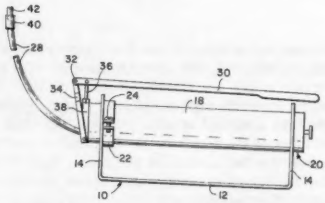
GREASE GUN STAND

Christiaan C. L. Reeberg, 111-67 145th St., Jamaica, N.Y. 11435

Filed Aug. 14, 1978, Ser. No. 933,512

Int. Cl.³ F16M *13/00*

U.S. Cl. 248—152 **2 Claims**



1. A portable stand for a grease gun having an elongated cylinder comprising:

a flat, substantially rectangular base panel, an end flange extending upwardly from each end of said base panel, said end flanges being substantially parallel, each end flange being provided with a hole intermediate its ends, said holes being horizontally aligned for receiving said cylinder, a generally cylindrical clamp secured to one flange adjacent the edge of the hole, a portion of the clamp being unattached to said flange to permit said clamp to be constricted about said cylinder, said clamp comprising a screw for constricting same about said cylinder, said base panel and end flanges being formed from a single piece of material.

4,254,927

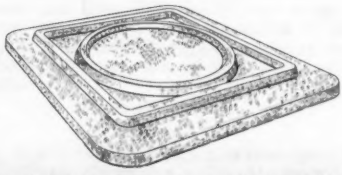
JACKING PLATE FOR TRAILER AND THE LIKE

James H. Stonhaus, P.O. Box 4097, Fresno, Calif. 93744

Filed Apr. 30, 1979, Ser. No. 34,829

Int. Cl.³ A47B *91/00*

U.S. Cl. 248—346 **1 Claim**



1. A support plate, having an upper and a lower face, for placement between the ground at the lower portion thereof and either a square base jack or a point loading support, such as a trailer third wheel, on the upper face thereof, said support plate comprising: a square plate having a generally flat lower face; a first load receiving area inset from the periphery of said square plate on the upper face thereof; a square flange set on

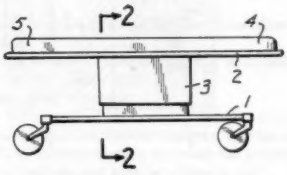
the inside of said first load receiving area so as to circumscribe the inner perimeter of said first load receiving area, said first load receiving area sized for placement of said square base jack thereon; a circular flange, said circular flange interior of said first load receiving area; a second load receiving area interior of said circular flange, said second load receiving area for placement of said point loading support thereon; whereby said respective flanges impart strength to said plate and prevent a load on either said load receiving areas from sliding over the surface of said plate.

4,254,928

STABILIZED ELEVATOR FOR STRETCHER OR THE LIKE

David F. Huempfner; Douglas A. Rippe, and Robert E. Martin, all of Two Rivers, Wis., assignors to American Hospital Supply Corporation, Evanston, Ill.

Filed Mar. 9, 1979, Ser. No. 19,042
Int. Cl.³ F16M *13/00*
U.S. Cl. 248—422 **21 Claims**



1. A stretcher or the like with a "central post" type elevator column having two intertelescoping sections, and a supporting top on the elevator column that is at least twice as large as the column's cross-sectional area, wherein the improvement comprises: a pair of stabilizing axles rotatably connected to a first intertelescoping section; at least one gear fixed to each axle, and this gear has teeth that intermesh with teeth on the other axle's gear causing the axles to simultaneously rotate; and a pair of toothed tracks, each track being secured along a major portion of its toothed length to a second intertelescoping section so that the teeth of the tracks intermesh with the teeth of the two gears, whereby cocking and binding between the two sections is prevented.

4,254,929

APPARATUS FOR ENABLING MOVEMENT OF A BINDER

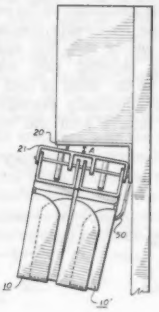
Robert H. Popper, Jr., 24 Raynold Rd., Mountain Lakes, N.J. 07046

Filed Feb. 12, 1979, Ser. No. 11,219
Int. Cl.³ A47F *7/14*
U.S. Cl. 248—447 **13 Claims**

1. An apparatus for enabling access to and automatic storage upon release of a binder relative to a support, comprising:

(a) means for enabling initial movement for access to and final movement for automatic storage of the binder relative to the support in a substantially off-horizontal plane; and

(b) means for enabling initial movement for automatic storage upon release of and final movement for access to the binder relative to the support in a substantially off-vertical



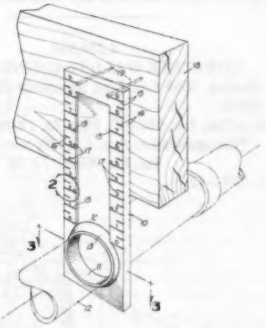
plane, connected to the substantially off-horizontal plane movement enabling means.

4,254,930

DRAIN PIPE HANGER

Ernest W. Warren, 201 Vistawood La., Marietta, Ga. 30066

Filed Jun. 29, 1979, Ser. No. 53,293
Int. Cl.³ E21F *17/02*
U.S. Cl. 248—542 **5 Claims**



1. A pipe hanger particularly for drain pipes comprising a plate-like body portion having aligned linear measuring scales on opposite sides thereof and extending in one direction on said hanger, said hanger having a pipe receiving through opening located near corresponding ends of said scales said scales having graduations which extend to the edges of the body and which are adapted to be placed in alignment with the lower end of a pipe supporting member, the scales and fastener receiving means located on the upper end of said plate like body being so marked as to indicate the distance between the graduations so aligned and a pipe supported by said hanger.

4,254,931

REAR VIEW MIRROR MOUNT FOR INTERIOR OF AUTOMOBILE

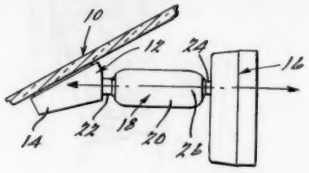
William R. Aikens, Birmingham, and Arthur W. Kurz, Southfield, both of Mich., assignors to Standard Mirror Company, Inc., Troy, Mich.

Filed Jun. 25, 1979, Ser. No. 51,679
Int. Cl.³ F16M *13/00*; A47G *1/24*
U.S. Cl. 248—549 **4 Claims**

1. The combination of an automotive vehicle windshield, a rear view mirror, and means mounting said mirror on the inside face of said windshield for adjustably positioning said

mirror thereon and for accomplishing a snap-off of the mirror from the windshield when impacted;

said last named means comprising a first mounting member fixed to the inside face of the windshield, a second mounting member removably disposed on said first mounting member, one of said first and second members having outwardly tapering side walls, a resilient member mounted on the other of said first and second members having longitudinally extending resilient side walls tapered to interfit with and resiliently engage said outwardly tapering side walls on said one of said first and second members to provide a snap-off interconnection between said first and second members upon impact with said mirror, a transverse locking serration provided on the inner facing wall of one of said first and second members, a lock spring on the inner facing wall of the other of said first and second members having an off-set end resiliently engageable with said serration, and said second member having a closed top end and an open bottom end providing access to said off-set end to permit longitudinal relative movement between said first and second members.

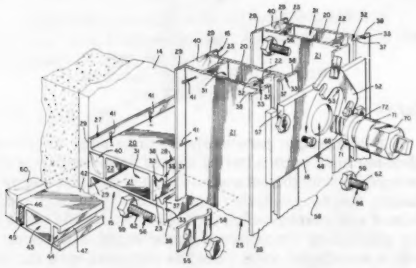


4,254,932

CONCRETE WALL FORMING SYSTEM

James Durbin, 2000 Old Lost Mountain Rd., Powder Springs, Ga. 30073

Division of Ser. No. 910,027, May 26, 1978, Pat. No. 4,192,481. This application Sep. 4, 1979, Ser. No. 71.851
Int. Cl.[3] E04G *17/06*
U.S. Cl. 249—42 3 Claims



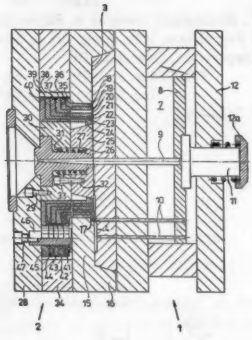
1. In a forming structure for use in the forming of concrete walls comprising a form, a plurality of rigid stringers attached to said form to act as support ribbing for said form, a plurality of rigid spaced apart stiffback supports oriented perpendicular to the stringers and attached to the stringers, a plurality of tie rods passing through the form with a tie rod nut including a neck portion with an annular groove defined in the neck portion threaded onto the tie rod at each of the ends of the tie rod, the improvement therein comprising a plurality of lock plates mounted on adjacent stiffbacks and spanning the space between said adjacent stiffbacks, a hole in each lock plate between said stiffbacks into which said tie rod nut is insertable, a locking collar attached to each said lock plate, each of said locking collars defining a slot extending inwardly from one of its edges of a breadth less than the breadth of the hole of its lock plate, each said locking collar being pivotably connected on one side of its slot to its said lock plate on one side of the hole in its lock plate and movable to a position with its slot aligned with the hole of its lock plate for releasably engaging said annular groove of said tie rod nut when said nut is inserted in said hole, and means for connecting each said locking collars to its locking plate on the side of the slot of the locking plate opposite to the pivotable connection of said locking collar to its lock plate, whereby each said lock plate holds a tie rod nut at a constant distance from its form and the tie rod nuts are exposed for rotation on their tie rods.

4,254,933

MOLD FOR INJECTION MOLDING

Eduardo D. L. C. Netto, Rua Sao Luiz Gonzaga 912, Rio de Janeiro, Brazil

Filed Dec. 26, 1979, Ser. No. 107,010
Int. Cl.[3] B29C *1/00;* B29F *1/00*
U.S. Cl. 249—103 15 Claims



1. In a mold for injection molding comprising two mold halves separable after each molding operation and having mating surfaces which define therebetween a plurality of molding cavities and injection channels opening into said cavities, the improvement comprising concentric rings in a first of said mold halves, rotatable about a reference axis perpendicular to said mating surfaces and forming portions of said cavities in positions equally spaced about the reference axis, each ring presenting to the interior of each cavity a marking that is different from those that it presents to the other cavities, means to rotate one of said rings by increments so that its markings are presented, one by one, to said cavities and to rotate each other ring by an increment each time the previous ring completes a revolution, in a manner similar to a mechanical counter, and actuating means to actuate said rotating means by an increment for each cycle of separation and approximation of said mold halves.

4,254,934

HYDRAULIC SYPHON WITH PNEUMATIC REFLUX

Francesco Amici, Piazza Cavour 17, Rome, Italy

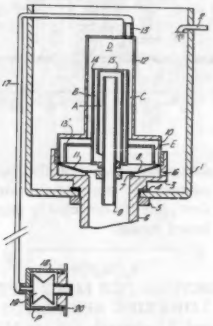
Filed Jul. 31, 1979, Ser. No. 62,399
Claims priority, application Italy, Aug. 4, 1978, 50597 A/78
Int. Cl.[3] F16K *31/126;* E03D *1/04*
U.S. Cl. 251—61.1 4 Claims

1. In a hydraulic syphon for a tank having a bottom, an interior and an exterior, of the type including

(a) an annular support means mounted on said tank bottom, having an outlet opening to the exterior of said tank, an inlet opening to said tank interior, and a valve seat annularly disposed about said outlet,

(b) a membrane having an opening therein annularly supported by said support means, movable from a first position where a portion of said membrane engages said valve seat to a second position not so engaging said valve seat,

(c) a first tubular element having a passage therethrough sealingly mounted on said membrane, said passage communicating with said opening in said membrane,
(d) a second tubular element annularly disposed around said first tubular element, having its upper end closed and spaced above said first tubular element,
(e) a third tubular element annularly disposed around said second tubular element, having its lower end annularly sealed to said first tubular element,
(f) a fourth tubular element annularly disposed about said third tubular element, having a bell-shaped lower end



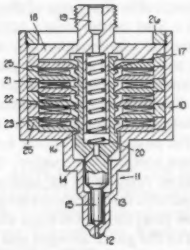
mounted on said support means, and a substantially closed upper end;
(g) actuation means in communication with said upper end of said fourth tubular element;
the improvement wherein
(i) the lower end of said second tubular element is connected to said first tubular element, and has a cut therein to allow communication between the interior and exterior of said second tubular element, and
(ii) the upper end of said third tubular element extends to substantially the same height as the upper end of said second tubular element.

4,254,935

SOLENOID CONSTRUCTION

Boaz A. Jarrett, London, England, assignor to Lucas Industries Limited, Birmingham, England

Filed Aug. 27, 1979, Ser. No. 69,792
Claims priority, application United Kingdom, Jul. 6, 1979, 23687/79
Int. Cl.³ F16K *31/06*
U.S. Cl. 251—137 **3 Claims**



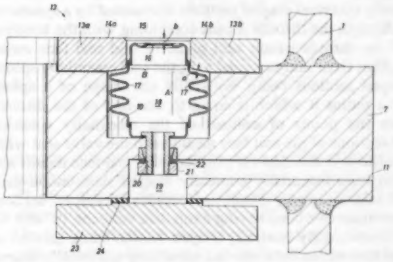
1. A solenoid valve comprising a cylindrical armature formed from magnetizable material and having a plurality of axially spaced annular grooves formed in its outer peripheral surface, the grooves lying in planes respectively perpendicular to the axis of movement of the armature, an electrical winding comprising a plurality of annular disc shaped winding portions surrounding the armature, each winding portion lying between an adjacent pair of a plurality of annular discs formed from magnetizable material and surrounding the armature, adjacent discs being in contact with each other at their outer edge portions, there being as many annular discs as there are grooves on the armature, the winding portions being arranged so that in use when electric current flows therethrough adjacent discs will assume opposite magnetic polarity, the magnetic flux effecting movement of the armature, each of said discs being divided into at least two parts whereby the discs can be assembled about the armature with the inner edges of the discs extending into the respective grooves the thickness of the inner edges of the discs being chosen in relation to the width of the grooves so that in the de-energised condition of the winding the discs are offset in the axial direction in relation to the grooves and a valve closure member movable by the armature.

4,254,936

BUTTERFLY VALVE

Pieter J. Schuurman, The Hague, Netherlands, assignor to Shell Oil Company, Houston, Tex.

Filed Dec. 5, 1978, Ser. No. 966,684
Claims priority, application United Kingdom, Dec. 7, 1977, 50942/77
Int. Cl.³ F16K *25/00*
U.S. Cl. 251—173 **3 Claims**

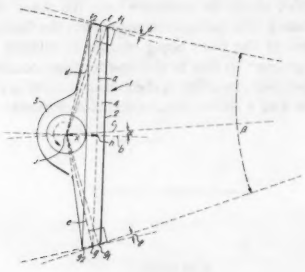


1. A butterfly valve providing improved fluid-tight closure for the control of gaseous fluids which comprises
(a) a valve disc having an annular sealing surface near its periphery,
(b) a valve seat in a housing accommodating the valve, said seat having two concentrically-spaced annular seating rings with flat seating surfaces, said seat being affixed in said housing so that during the valve closure the flat seating surfaces of the two annular rings seal against the valve disc annular sealing surface, and said seat having an elastic sealing means disposed in the annular space between the seating rings which means has a hollow interior in communication with an externally-supplied fluid under pressure the action of which expands the elastic sealing means for contact with the sealing surface of the valve disc during valve closure,
(c) first actuating means for opening the valve, and for closing the valve by bringing into contact the sealing surface of the valve disc and the flat seating surfaces of the valve seat annular seating rings, and
(d) second actuating means supplying fluid under pressure to the interior of the elastic sealing means of the valve seat for bringing into contact the elastic sealing means and the sealing surface of the valve disc during valve closure.

4,254,937
BUTTERFLY VALVE

Folke H. Hubertson, Säffle, Sweden, assignor to Aktiebolaget Somas Ventiler, Säffle, Sweden

Filed Apr. 17, 1979, Ser. No. 30,860
Claims priority, application Sweden, Nov. 17, 1978, 7811864
Int. Cl.[3] F16K *1/22*
U.S. Cl. 251—305 6 Claims



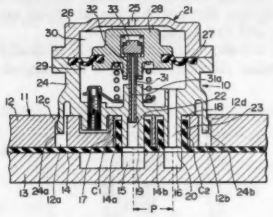
1. Buttertly valve comprising a valve housing having a valve seat therein, throttle means located in said housing for movement between an open position and a shut-off position, a stem around which the throttle means rotates, seal face means on the throttle means for pressing against the valve seat when the throttle means is in the shut-off position to close the valve against flow of material therethrough, said seal face means defining a plane said seal face means including two opposite, essentially spherical shaped sections intersected by a symmetry plane through the throttle means coinciding with the torsional axis of the throttle means said plane of said seal face means being offset from said torsional axis, the said essentially spherical shaped sections being essentially the shape of a sphere having a radius R which is equal to one-half of the distance between the points of contact of the essentially spherical shaped sections of the seal face means with the valve seat when the throttle is in the shut-off position, said seal face means also including two essentially conically shaped sections on each side of said symmetry plane, said conically shaped sections being portions of a cone having a top rake between 10° and 40° and each essentially conically shaped section being located on said seal face means between said essentially spherically shaped sections, each said essentially spherically shaped section and each said essentially conically shaped section successively merging into each other, said essentially conically shaped sections and said essentially spherically shaped sections being in sealing engagement with a significant portion of said valve seat when said throttle means is in said shut-off position.

4,254,938
SUCTION PRESSURE RESPONSIVE VALVE DEVICE

Masami Inada, Kariya; Kazuhiko Kitamura, Toyota; Shoji Ito, Nagoya; Takao Nonoyama, and Riichi Tsuji, both of Toyota, all of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya and Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, both of, Japan

Filed Jul. 24, 1979, Ser. No. 60,038
Claims priority, application Japan, Jul. 25, 1978, 53-102037[U]
Int. Cl.[3] F16K *31/12;* F16J *15/16;* F16K *51/00*
U.S. Cl. 251—367 3 Claims

1. A valve device comprising base board means including a first plate formed with at least one opening and a second plate formed with at least one channel communicating with said one opening, sealing member means including a resilient sealing gasket interposed between said first and second plates, said first and second plates being superimposed on each other, and at least one resilient cylindrical projection integrally formed with said sealing gasket and disposed in said one opening with radial clearance with respect to said one opening; and a valve unit including at least one tubular portion adapted to be sealingly inserted into said resilient cylindrical projection for valving fluid flow through said cylindrical projection with the channel

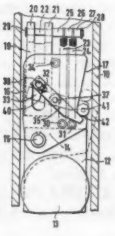


of said second plate, said valve unit also including a pair of resilient fingers adapted for engagement with corresponding openings in said first plate for detachably mounting said valve unit on said bae board means.

4,254,939
SAFETY DEVICES FOR LOAD LIFTING AND LOWERING APPARATUS

Michael A. Buzzard, Letchworth, and Ian Michael D. Gaylor, Harpenden, both of England, assignors to Ratcliff Tail Lifts Limited, Welwyn Garden City, England

Filed May 25, 1979, Ser. No. 42,430
Claims priority, application United Kingdom, May 31, 1978, 24973/78
Int. Cl.[3] B66F *7/12*
U.S. Cl. 254—89 R 8 Claims



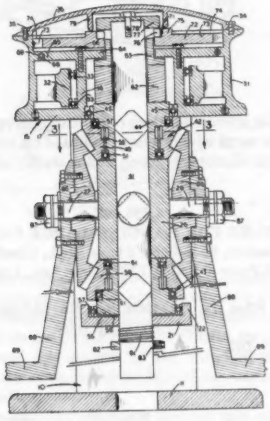
1. Load lifting and lowering apparatus comprising a pair of parallel spaced apart upright guide members of hollow section, a pair of runners each movable along one of the guide members and each mounted on a load carrier, and a cable connected to each runner for pulling the runners upwardly along the guide members or lowering the runners down the guide members to respectively raise or lower the platforms, wherein at least one runner has pivotally mounted on it pawl means to which the cable is indirectly connected through cable connection means slidably mounted on the pawl means, spring means urging the cable connection means towards the runner, the pawl means having one edge tapered relative to an adjacent wall of the guide member, the apparatus further comprising locking means movable relative to the pawl means between said tapered edge and said adjacent wall of the guide member and means to move the locking means in accordance with the spacing of the cable connection means from the runner such that upward movement of the locking means engages the pawl means in the guide member with a jamming fit, the arrangement being such that the pawl means is held out frictional engagement with the guide member by tension in the cable, and when tension in the cable is released the spring means urges the cable connection means towards the runner, causing said movable locking means

to move upwardly relative to the tapered edge of the pawl means to engage the pawl means with the guide member by a jamming fit.

4,254,940
WINCH

Olav Thyvold, 3004 Craigowan Rd., Victoria, British Columbia, Canada

Filed Mar. 22, 1979, Ser. No. 22,727
Int. Cl.³ B66D 1/04
U.S. Cl. 254—341 **3 Claims**



1. A winch comprising:
(a) an elongated supporting frame,
(b) a drum mounted for unidirectional rotation on the frame,
(c) a drive shaft rotatably supported by and extending longitudinally of the frame,
(d) means for connecting the drive shaft and drum for mutual rotation,
(e) a pair of gear rings rotatably mounted in the frame in spaced relationship over and rotatable relative to the shaft,
(f) two manually operated gears mounted in diametrically opposed relationship relative to the shaft for oscillatory movement on the frame between and meshing with the gear rings for oscillating the latter, each manually operated gear having a crank for oscillating its associated gear and a pedal on the crank so the cranks can be pumped alternately by an operator's feet to oscillate the manually operated gears, and
(g) locking means automatically operable for locking each gear ring and the drive shaft for mutual rotation when each gear ring is rotated in a direction required to obtain said unidirectional rotation of the drum.

4,254,941
AUTOMATIC ANTI-FALL DEVICE FOR MANUAL OR MOTORIZED LIFTING SYSTEMS

Rodolphe Tanson, Moutfort, Luxembourg, assignor to Groupements d'Interets Economiques Europe-Levage-Manutention (ELMA), Bagnolet, France

Filed Jun. 6, 1979, Ser. No. 45,871
Int. Cl.³ B66D 5/16
U.S. Cl. 254—267 **10 Claims**

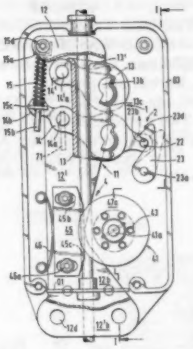
1. Automatic safety apparatus adapted to working with a cable passing through it for stopping a load in the event of a breakdown of a motor driven and manual hoisting and pulling system, which comprises

an automatic cable clamping device **1** consisting of a self-tightening jaw block **(11)** with two jaws **(13)**, **(13')** located in the proximity of the cable, said jaws being constantly urged by a pair of spring driven levers **(14)**, **(14')** to clamp the cable, whereby said jaw actuating levers are pivoted on two flanges **(12)**, **(12')** parallel to the cable, which are connected with the load by means of case **0** of the safety apparatus, as well as—in the case of a motor driven hoisting and pulling system

an automatic motor(s) stopping device **5** comprising a circuit breaker **51** coupled with the cable clamping device **1**, so that, while jaw block **11** is not prevented from clamping the cable, circuit breaker **51** interrupts feeding of the motor(s) driving the hoisting and pulling system, and which comprises besides, on the one hand,

an engaging device **2** adapted to prevent working of said cable clamping device and of said eventual motor(s) stopping device as long as the relative speed of the safety apparatus and of the cable is lower than a pre-established critical speed, and, on the other hand,

an automatic releasing device **3** of said automatic cable clamping device and of said eventual motor(s) stopping



device, which is actuated by the centrifugal force developing in an inertia block **32** rotated by a driving member **41** of a driving device **4**, whereby said driving member directly or indirectly receives itself a rotary motion from the cable, and which is adapted to neutralize the action of said engaging device as soon as the relative speed of the cable and of the safety apparatus attains said critical speed, and

a manual releasing device **6** being adapted to neutralize the action of said engaging device indepentently from the relative speed of the cable and of the safety apparatus, characterized by the fact that said flanges **12**, **12'** to which the self-tightening block **11** is linked through its jaw actuating levers **14** are connected with the load directly and-/or by means of a case of a hoisting and pulling apparatus A.L. so that the safety apparatus is adapted to work in order to stop the load either, by a breaking of the cable of the hoisting and pulling apparatus, on an auxiliary cable, or, by attaining said critical speed, as well on the cable of the hoisting and pulling apparatus as on an auxiliary cable.

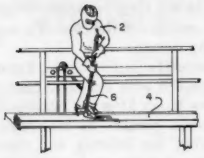
4,254,942
SCARFING TORCH

Arthur H. Fieser, Wexford, and Charles H. Anderson, Jr., McMurray, Both of Pa., assignors to A. F. Industries, Inc., Pittsburgh, Pa.

Filed May 18, 1979, Ser. No. 40,414
Int. Cl.³ B23K 7/06
U.S. Cl. 266—51 **3 Claims**

1. In a scarfing torch adapted for manual manipulation, said torch including means for conducting oxygen gas into impingement with the surface of a steel workpiece after said surface has been heated, said torch being acted upon by a first

force generated by conduction of said oxygen gas during operation of said torch and a second force due to gravity, the improvement comprising:



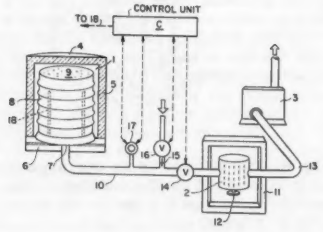
means disposed in said torch for releasing a secondary fluid in a direction away from the direction of flow of said impinging oxygen gas to provide at least one component of force upon said torch that tends to offset at least one of said first and second forces acting upon said torch.

4,254,943

APPARATUS FOR REMOVING MERCURY FROM SOLID WASTE MATERIAL

Karl-Ake G. Björkman, Karlskrona, Sweden, assignor to Lumalampan AB, Karlskrona, Sweden

Continuation-in-part of Ser. No. 27,901, Apr. 6, 1979, abandoned. This application Jul. 17, 1979, Ser. No. 58,278
Claims priority, application Sweden, Apr. 12, 1978, 7804104
Int. Cl.³ C22B *9/04*
U.S. Cl. 266—149 **3 Claims**



1. Apparatus for carrying out the removal of mercury from mercury-containing solid waste comprising in combination a vacuum chamber containing heating means for heating mercury-containing solid waste; a vacuum pump; a conduit connecting said vacuum pump and vacuum chamber; and a mercury cooling trap located in said conduit; an inert gas injection inlet into said conduit; a means for controlling injection of inert gas into said conduit; and a valve in said conduit positioned between said inert gas inlet and said vacuum pump, and means for closing said valve when inert gas is injected into said conduit, and control means for sequentially and periodically injecting inert gas while said valve is closed, and for opening said valve when said inert gas is not injected into said conduit.

4,254,944

FRAMEWORK FOR A BASKET FOR HEAT TREATING AT HIGH TEMPERATURES, AND A METHOD FOR MANUFACTURING THE SAME

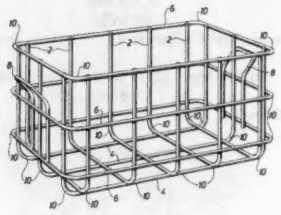
Sten von Matern, and Rune Ö. W. Fredriksson, both of Avesta, Sweden, assignors to Avesta Jernverks Aktiebolag, Sweden

Filed Feb. 7, 1979, Ser. No. 9,921
Claims priority, application Sweden, Feb. 10, 1978, 7801597
Int. Cl.³ C21D *1/00*
U.S. Cl. 266—275 **12 Claims**

1. A framework for a basket for heat treating articles such as metal parts at high temperatures comprising

a plurality of bars of heat resistant metal mutually crossing each other to form the bottom wall and side walls of said framework,

and flexible interconnections between the mutually adjacent edges of said respective walls,



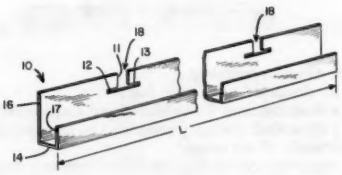
said flexible interconnections comprising curved bars of heat resistant metal having a large radius of curvature arranged in spaced relationship along said mutually adjacent edges.

4,254,945

FIXTURE FOR HANGING LARGE PANELS

Leland E. Paulson, 8528 Great Plains Blvd., Chanhassen, Minn. 55317, and Peter J. Smith, 20075 Italy Ave., Lakeville, Minn. 55044

Filed Apr. 21, 1980, Ser. No. 142,466
Int. Cl.³ B23Q *3/00*
U.S. Cl. 269—102 **10 Claims**



1. Apparatus for supporting and assisting in the attachment of large panels, comprising an elongated channel member having a raised front lip and a higher raised rear side wall, said side wall having a plurality of slots in the shape of inverted T's spaced along its top edge.

4,254,946

LOWER UNIT REPAIR FIXTURE

Robert M. Kerr, P.O. Box 1135, and George F. Crabtree, 174 Roper Dr., both of Winter Garden, Fla. 32787

Filed Jun. 29, 1979, Ser. No. 53,457
Int. Cl.³ B23Q *3/00*
U.S. Cl. 269—152 **4 Claims**

1. In an outboard motor repair fixture for use in clamping the lower unit of an outboard motor, said lower unit including a housing with a pointed leading section and horizontal fin elements, the repair fixture including an elongated, tubular supporting projection engaged telescopically in a horizontal sleeve fixedly mounted on a work surface, the repair fixture comprising:

a substantially uniform main body section including a bight portion and proximal and distal side arms projecting from the ends of the bight portion;

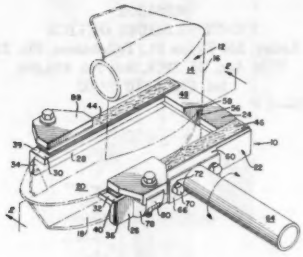
each of the side arms being of L-shaped cross section and including a top plate and a side plate;

the bight portion having a top surface horizontally aligned with the top plates of the side arms, a bottom surface, and having a slant wall extending from the top surface to the bottom surface;

the bight portion having a centrally located substantially V-form notch formed therein opening on said top surface and having a rearwardly slooping rounded apex extending to the bottom surface, the V-notch receiving the pointed leading section of the lower unit;

the side plate of the proximal side arm having a boss member fixedly secured thereon and the tubular supporting projection being detachably secured to said boss member;

each of the side arms having outwardly extending bracket ledges with openings therein;



clamp plates engaged on said bracket ledges, the clamp plates having clamp surfaces extending over the top plates of the respective side arms, the clamp plates having slots therein over the openings of the bracket ledges;

the horizontal fin element of the outboard motor being engaged between the respective clamp surfaces and the top plates; and

changeable fasteners extending through said aligned openings and slots to releasably lock the clamp plates over the fin element.

4,254,947

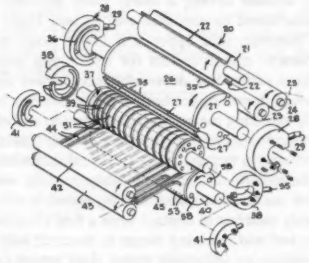
SHEET OVERLAP DEVICE

John F. Trogan, Ashland, Wis., assignor to C. G. Bretting Mfg. Co. Inc., Ashland, Wis.

Filed May 30, 1979, Ser. No. 44,208

Int. Cl.³ B41L *1/32*

U.S. Cl. 270—39 **6 Claims**



1. In a sheet overlapping apparatus, which includes oppositely rotating coacting feed rolls,

means for introducing stock material between the feed rolls,

a rotating bed roll and a rotating fly knife roll mounted adjacent each other,

means for rotating said fly knife roll and said bed roll in opposite directions relative to each other,

means for directing the stock material between said fly knife roll and said bed roll whereby sections of stock material are severed and cut in to sheets, and

a rotating pressure roll cooperatively mounted relative to said bed roll forming a nip therebetween through which the sheets are fed,

the improvements include:

vacuum means on said bed roll for holding the sheets thereon,

a lap roll contiguous to said bed roll,

means for rotating said lap roll and said bed roll in opposite directions relative to each other, and at the same surface velocity,

vacuum means on said lap roll for holding the sheets on the periphery of said lap roll to thereby transfer of sheets from said vacuum bed roll to said vacuum lap roll at the same surface velocity,

a pair of coacting retard rolls for engaging the sheets therebetween and located immediately downstream of said lap roll relative to the path of movement of the sheets,

means to rotate said retard rolls at a speed of approximately two thirds of the speed of said bed roll thereby producing an overlap in said sheets of approximately one-third the length thereof as successive sheets are advanced through said apparatus,

and top strippers and bottom guides interposed between said retard rolls and said lap roll to respectively strip sheets from said lap roll and guide the sheets to the retard rolls.

4,254,948

MECHANIZED CRUTCH

Eugene A. Jacobs, 8119 Oakleigh Rd., Baltimore, Md. 21234

Filed Jan. 5, 1979, Ser. No. 1,211

Int. Cl.³ A61H *3/04*

U.S. Cl. 272—70.3 **14 Claims**

1. A mechanized crutch for providing locomotion on a support surface to a person having an injured leg, comprising:

a vertically extending elongated leg member having a top and a lower portion;

body support means, connected to said elongated leg member for engaging the side of the person's body which includes the injured leg to support the side of the body of the person in a standing position while the person's other leg is engaging the surface, whereby said elongated leg member completely supports the person and said body support means when the person lifts his other leg from said surface, said body support means including means for engaging the injured leg and supporting the injured leg off of the surface;

a first lower wheel connected to said lower portion of said elongated leg member for rotation to locomote said person and said mechanized crutch when the person moves the other leg in a walking motion; and

means, connected to said elongated leg member, for driving said first lower wheel.

4,254,949

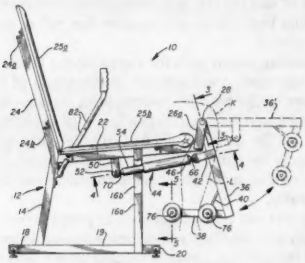
LEG CURL EXERCISING DEVICE

Jerry D. Brentham, 102 Elm Dr., Belton, Tex. 75613

Filed Jun. 12, 1978, Ser. No. 914,356

Int. Cl.³ A63B *23/04*

U.S. Cl. 272—130 **5 Claims**



1. A leg curl exercising device comprising: a support frame; a seat support member on said frame; a back support member on said frame, said seat support member and back being oriented at an obtuse angle relative to one another; hand grip means upwardly of the seat support and forwardly of the back support on each side of said frame to resist movement of the body of a user; actuating means pivotally secured to said support frame for engaging the legs of a user such that the axis of rotation of said actuating means is substantially coaxially aligned with the axis of rotation of the knee joints of the user, said actuating means extending between the knees of the user; double resistant actuated means pivotally secured to the support frame and to the actuating means for resisting movement of said actuating means in said direction between a position with the leg beneath the knee of the user being at an acute angle relative to the leg above the knee and a position with the leg being substantially extended; and roller means extending outwardly from each side of said actuating means to simultaneously engage the front and rear of each ankle of the user.

4,254,950

BODY EXERCISE APPARATUS

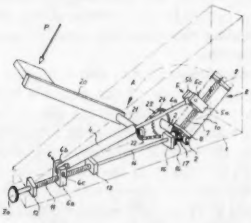
Rene Baumann, Lucerne, Switzerland, assignor to Wiba AG, Kriens, Switzerland

Filed Sep. 5, 1979, Ser. No. 72,686

Claims priority, application Fed. Rep. of Germany, Sep. 9, 1978, 2839300

Int. Cl.³ A63B *21/00*

U.S. Cl. 272—130 **8 Claims**



1. Body exercising apparatus comprising a frame, a lever which can swivel on the frame about a swivel axis, a spring which is attached at its two ends to the frame and to the lever, respectively, by means of first and second mountings which in each case are adjustable in position towards and away from the swivel axis, an actuating member, upon which body effort may be exerted in order to swivel the lever against the action of the spring in a swivel field limited by two end positions which are respectively arranged at acute and obtuse angles to the frame, and adjustment means operable to effect the simultaneous adjustment of the positions of the mountings relative to the swivel axis of the lever so as to alter the moment characteristics of the lever within its swivel field.

4,254,951

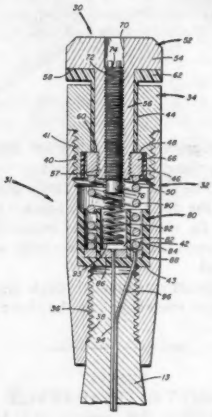
FENCING POINT DEVICE

Jan R. De Laney, 530 Bryan St., Tallahassee, Fla. 32304

Filed Aug. 24, 1978, Ser. No. 936,496

Int. Cl.³ A63B *69/02*

U.S. Cl. 273—1 F **6 Claims**

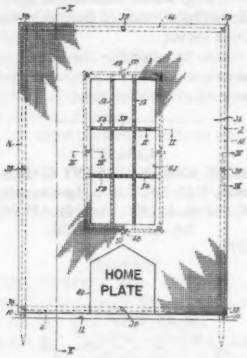


1. A fencing point device adapted to be attached to a free end of a fencing blade or similar weapon that is electrically connectable to a means for recording a hit on a recording apparatus during a fencing match, which point comprises a hollow body section having a lower body member having means for attachment to said free end of said blade and an upper body member, said upper and lower body members having attachment means therein for removably connecting them together, a protruding depressible conductive tip means slidably mounted in said upper hollow body member having a conductive tip retaining means positioned on the end of the tip means that extends into said hollow body section, said retaining means and said tip means having electrical insulation means to insulate them from said hollow body section when depressed, a first conductive spring biasing means positioned in said lower body member in contact with a first electrical conductor means and said retaining means to maintain said tip in a protruded position, an adjustable screw shaft means centrally positioned in said tip means with one end thereof extending in said hollow body and the other end having an adjustment means thereon just below the surface of the face of the tip means, a second conductive spring biasing means attached to the end of said screw means that depends in said hollow body adjustably positioned above a second electrical conductor means, said first and second conductor means having insulation means therebetween, whereby said screw shaft means can be manually adjusted from the outside of said point device for length of travel of said tip means when it is depressed before contact is made between the depending end of said second biasing means and said second conductor means to record a hit.

4,254,952
PITCHING PRACTICE DEVICE

George H. Playter, Jr., 125 N. Oakley St., Kansas City, Mo. 64123

Filed Dec. 11, 1978, Ser. No. 968,189
Int. Cl.[3] A63B 69/00
U.S. Cl. 273—26 A 5 Claims

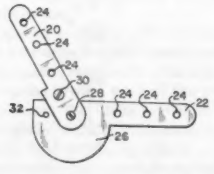


1. A baseball pitching practice device comprising:
a. a stand,
b. means operable to anchor said stand relative to the ground, in upstanding relation from the ground,
c. a generally rectangular sheet of flexible material disposed in a generally vertical plane and having an aperture forming a strike zone formed therein whereby a pitcher may pitch baseballs at the exposed forward surface of said sheet to pass through said aperture, said sheet being spaced forwardly from said stand and said stand being disposed entirely behind said sheet, and
d. connecting means extending forwardly from said stand and connected to the peripheral edge of said sheet, said connecting means being resiliently yieldable in a rearwardly horizontal direction, whereby to be yieldable under the impact of baseballs striking said sheet in the area of said connecting means, said connecting means comprising a series of horizontal, forwardly-opening socket members affixed to said stand in spaced relation about the periphery of said sheet, an elongated horizontal stud slidably mounted in each of said sockets and affixed at its forwardly extended end to said sheet, and a spring yieldably resisting rearward movement of said stud in said socket member.

4,254,953
ELBOW MOVEMENT RESTRICTER

Ralph D. Marchetti, 1040 Wayside Rd., Wayside, N.J. 07712

Filed Apr. 26, 1979, Ser. No. 33,398
Int. Cl.[3] A63B 69/36; A63D 5/00
U.S. Cl. 273—54 B 1 Claim

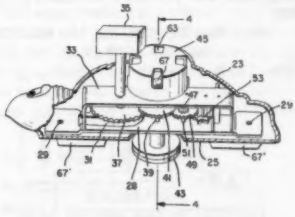


1. An elbow movement restricter for use by a bowler comprising:
first strap means adapted to encirle the upper arm of the bowler above the elbow, to be held in place thereat;
second strap means adapted to encircle the forearm of said bowler below the elbow, to be held in place thereat;
and means adapted to be positioned adjacent said elbow, interconnecting said first and second strap means, controllable to vary the tension thereof in restricting the movement of said first strap means relative to said second strap means during movement of the arm of said bowler to which said restricter is affixed;
wherein said interconnecting means is adapted to be positioned adjacent the elbow only on the inside position of the right arm of a right handed bowler, and adjacent the elbow only on the inside portion of the left arm of a left handed bowler;
wherein said interconnecting means incorporates a pair of extending arms coupled to respective ones of said first and second strap means and rotatable one about the other, and further incorporates means for continuously varying the tension between said pair of extending arms to controllably vary the relative movement between said strap means in maintaining substantially straight the elbow of the delivery arm of a bowler during the bowling motion;
wherein the one of said pair of extending arms which is coupled to said first strap means includes a semicircular land situate adjacent the crook of the bowler's elbow;
wherein the other of said pair of extending arms which is coupled to said second strap means is secured to said semicircular land by a pivot means so as to form a hinge therebetween; and
wherein said tension varying means comprises screw means extending in a direction through said other of said pair of extending arms towards the land of said one of said pair of extending arms, and rotatable in clockwise and counterclockwise directions to controllably vary the relative movement between said pair of extending arms and between said first and second strap means to which said extending arms are coupled.

4,254,954
TORTOISE AND HARE GAME

Tobin Wolf, 285 Aycriff Ave., Passaic, N.J. 07006

Division of Ser. No. 877,473, Feb. 13, 1978, Pat. No. 4,225,138.
This application Dec. 17, 1979, Ser. No. 103,967
Int. Cl.[3] A63F 3/00
U.S. Cl. 273—144 B 2 Claims



1. A game piece which comprises, in combination,
(a) a housing having a top and a substantially flat bottom, at least two spaced points of said piece extending below said bottom,
(b) a motor means secured within said housing,
(c) a shaft driven by said motor means, said shaft being positioned at an acute angle relative to the bottom of said housing.
(d) a wheel secured at one end of said shaft extending below the bottom of said housing and coaxial with said shaft, and
(e) a ball tumbler secured at the other end of said shaft, said ball tumbler including at least one window, plural balls therein and a pair of fingers flanking said window and

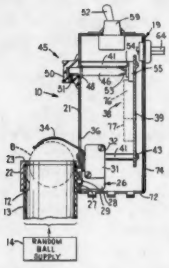
spaced apart by an amount greater than the diameter of one ball and less than the diameter of two balls.

4,254,955

GAME TIMER APPARATUS

Carl M. Dundon, 637 Beacon Square Dr., Holiday, Fla. 33590, and Cletus Israels, 10535 Shaver Rd., Portage, Mich. 49081

Filed May 10, 1979, Ser. No. 37,702
Int. Cl.³ A63F *3/06*
U.S. Cl. 273—148 R **9 Claims**



1. In a bingo game apparatus to assist an operator in calling out bingo indicia to be played, the combination comprising:

means for supplying bingo indicia carrying articles one after another along a path to an outlet for removal one at a time by said operator;

limit switch means fixed along said path, said limit switch having a displaceable actuator at least in part blocking said outlet and displaced by each article removed from said outlet by said operator so as to actuate said limit switch means;

timer means responsive to actuation of said limit switch means for timing an interval sufficient for calling out and playing the bingo indicia on said indicia carrying article; and

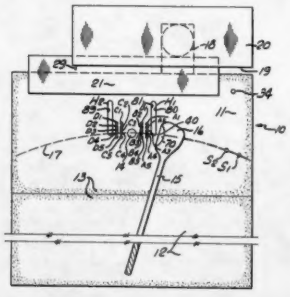
signal means located adjacent said article outlet and responsive to said timer means for signaling the occurrence of said interval to the operator.

4,254,956

GOLF SWING TRAINING APPARATUS

Thomas L. Rusnak, 349 Toftrees Ave., Apt. 210, State College, Pa. 16801

Filed Nov. 21, 1978, Ser. No. 962,757
Int. Cl.³ A63B *69/36*
U.S. Cl. 273—186 R **7 Claims**



1. In golf practice apparatus which includes structure defining a normal path direction and a normal point of impact of a golf club head during a practice swing, mechanism for representing the lateral or vertical position of the swinging club head, comprising in combination,

a light sensitive sensor,

a continuous strip sensor positioned laterally of the club head path for developing a signal proportional to the portion of length thereof passed over by a swinging club head,

said continuous strip sensor including a light receiving strip means to focus light received from the entire strip to said light sensitive sensor,

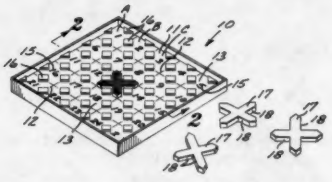
and output means for utilizing the output signal from the continuous strip sensor as a representation of the lateral or vertical position of the club head.

4,254,957

GAME PIECE ARRANGEMENT GAME DEVICE

George A. Kramer, P.O. Box 39568, Los Angeles, Calif. 90039

Filed Feb. 4, 1980, Ser. No. 117,963
Int. Cl.³ A63F *3/00*
U.S. Cl. 273—271 **4 Claims**



1. A game assembly adapted to selectively retain in geometric arrangement playing pieces comprising:

a rectangular planar board including a peripheral edge disposed thereabout, said edge extending normally about the plane of said board to form a containing structure in conjunction therewith, said board further including a plurality of diagonally aligned raised square projections on the surface thereof in equal spacing increments for defining equal playing fields there between; and

said playing pieces are each conformed as rectangular plates of a size substantially equal to that of said fields, each said piece including V-shaped cutouts at each edge thereof adapted to receive said diagonally aligned projections.

4,254,958

ARROWHEAD AND METHOD OF MAKING

Earle W. Bateman, III, 705 Robin Cir., Pasadena, Tex. 77502

Filed Oct. 29, 1979, Ser. No. 88,874
Int. Cl.³ F41B *5/02*
U.S. Cl. 273—421 **12 Claims**

4. An arrowhead for attachment to an arrow shaft comprising,

a flat base for abutting the end of the shaft, said base includ-

ing an opening in its center for receiving a fastener for securing the base to said shaft,

a plurality of support sides connected to said base and extending generally perpendicular to said base for enclosing the end of the shaft, and

a blade connected to each outer edge of said sides extending outwardly from said sides and in a plane generally perpendicular to said base.

6. The method of making an arrowhead for attachment to an arrow shaft comprising,

making a hole in a flat metal body,

cutting a plurality of slits in said body extending from the outer periphery of the body toward the center of the body to form a plurality of sides,

bending the cut edges outwardly to form a blade at each cut edge, and

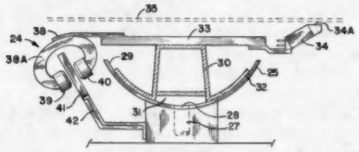
folding the sides in a direction opposite to the direction of bending the cut edges to form a plurality of support sides generally perpendicular to the plane of the cut hole.

4,254,959

PHONOGRAPH TONE ARM CONTROL SYSTEM

Earl E. Masterson, Minneapolis, Minn., assignor to Masterson Engineering Inc., St. Louis Park, Minn.

Filed Jun. 28, 1979, Ser. No. 52,731
Int. Cl.³ G11B *17/06*
U.S. Cl. 369—41 **36 Claims**



1. An apparatus for reproducing sound recordings from phonograph records comprising:

a tone arm supported on low-friction bearing system defining a substantially linear path along which said tone arm enjoys free essentially frictionless linear travel, said tone arm also being free to pivot vertically in an essentially frictionless manner;

a pickup carried by said tone arm such that linear travel of said tone arm products a corresponding linear radial displacement of said pickup relative to a phonograph record to be played and vertical pivoting of said tone arm produces corresponding essentially vertical displacement of said pickup;

position control means for controlling the linear position of said tone arm, including positioning electromagnetic force producing means for applying a force to said tone arm in either direction along said linear path and positioning force modulating means for balancing said electromagnetic force in a manner which allows reproducible positive positioning of said tone arm at any point along said path wherein said electromagnetic force producing means comprises:

a pair of spaced magnetic field producing means defining a gap therebetween,

coil means disposed in said gap along and parallel to the path of said tone arm, said coil means having an increasing electromagnetic interaction with said magnetic field producing means toward each of the two ends of said path and wherein the linear travel of said tone arm produces a relative motion between said coil means and said magnetic field producing means

wherein said positioning force modulating means comprises:

adjustable current distribution means for proportioning electric current in said coil means such that the opposing linear forces produced thereby can be balanced at any point along said path to repeatably position said tone arm wherever desired

pivot control means for controlling the vertical pivoting of said tone arm comprising:

pivoting electromagnetic force producing means for applying a force to said tone arm to produce a vertical pivot thereof;

pivoting force modulating means for controlling said vertical pivot including the pressure of said stylus on said record;

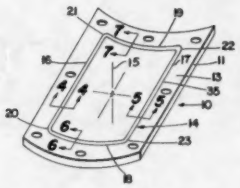
means for supplying electrical current to said position and pivot control means.

4,254,960

SEALING DEVICE

Jerry G. Jelinek, La Habra, Calif., assignor to Parker-Hannifin Corporation, Cleveland, Ohio

Filed Jun. 18, 1979, Ser. No. 49,260
Int. Cl.³ F06B *7/16*; F16J *15/10*
U.S. Cl. 277—12 **14 Claims**



1. A sealing device comprising a member of rigid material having an upper surface which in a first plane of cross section through said surface is curved and which in a second plane of cross section through said surface normal to said first plane is straight, said member having a transverse central axis, said upper surface having a circumferentially continuous groove therein comprising a first pair of spaced apart groove sections extending generally parallel to said first plane and a second pair of spaced apart groove sections extending generally parallel to the second plane and joining with said first groove sections, an annular packing of resilient material within said groove and having a portion projecting from said groove upwardly of said upper surface and also having a recess below said upper surface, said packing having a surface extending upwardly from the lower end of said recess to said projection, and said packing surface in any plane transverse of the packing being in a line such that no point on said line that is upwardly of another point on said line is radially inward of said another point.

4,254,961

SEAL FOR FLUID BEARINGS

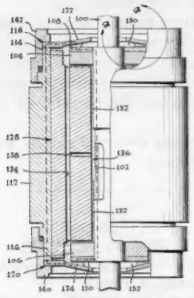
Rena S. Fersht, Studio City, and Winston L. Skinner, Canoga Park, both of Calif., assignors to Litton Systems, Inc., Beverly Hills, Calif.

Filed Apr. 30, 1979, Ser. No. 34,549
Int. Cl.³ F16J *15/00, 15/40*
U.S. Cl. 277—80 **18 Claims**

1. Apparatus for confining a ferro-fluid containing ferromagnetic particles comprising:

two ferro-magnetic members positioned adjacent each other to form a pocket therebetween for receiving a ferro-fluid, opposing surfaces of said two members having the shape of segments of surface of revolution, the opposing faces of said segments diverging from a close spacing adjacent said pocket toward a wider spacing away from said pocket on

radii from the axis of revolution to cause a magnetic gradient between said ferro-magnetic members in a radial direction to force ferro-fluid toward and hold ferro-fluid in said pocket.

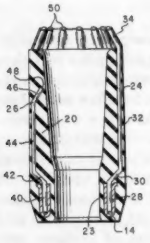


4,254,962

SWAB CUP HAVING LONG AND SHORT REINFORCING MEMBERS

Henry W. Blackwell, Venus, Tex., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed Jul. 25, 1979, Ser. No. 60,247
Int. Cl.³ F16J *1/04, 15/56*
U.S. Cl. 277—181 **5 Claims**



1. An improved swab cup assembly comprising:

(a) a unitary base member of U-shaped cross-section formed from a single annular member to include an annular bottom portion having inner and outer peripheral edges and inner and outer wall portions from the respective inner and outer peripheral edges of said bottom portion, said wall portions extending in spaced, generally concentric parallel relationship forming an annular slot therebetween;

(b) a plurality of elongated wire members having straight lower end portions, S-shaped intermediate portions, and inwardly bent upper portions, said lower portions being disposed in said slot in circumferentially spaced relationship and in tight, frictional engagement with said wall portions whereby the lower end portions of said wire members are retained immobile with respect to said base member and each other;

(c) a portion of said wire members being shorter wire members that are substantially shorter than the other longer wire members, said shorter and said longer wire members being arranged in an alternating relation in placement around said base member; and

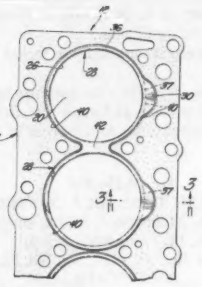
(d) elastomeric means encapsulating said base member, said shorter wire members and lower and at least intermediate portions of each of said longer wire members for forming said base member and said wire members into an annular swab cup assembly.

4,254,963

GASKET ASSEMBLY

Robert R. Skrycki, Grosse Isle, Mich., assignor to Ex-Cell-O Corporation, Troy, Mich.

Filed Dec. 4, 1979, Ser. No. 100,118
Int. Cl.³ F16J *15/12*
U.S. Cl. 277—235 R **4 Claims**



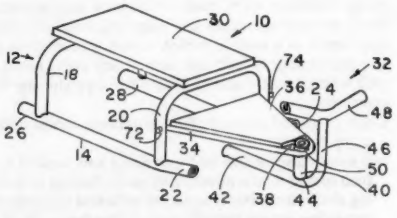
1. A head gasket assembly adapted to be disposed between a head having a combustion chamber therein and a cylinder block having a cylinder therein with the combustion chamber located at least partially outside the diameter of the cylinder and with a chamber insert disposed in the head for defining the passage between the chamber and the cylinder, said gasket comprising; body means defining two parallel surfaces adapted to engage and seal said head and said cylinder block, said body means including a metal core having a resilient fiber on opposite surfaces thereof and at least one cylinder opening for surrounding the cylinder, a metal flange surrounding said cylinder opening, said metal flange being U-shaped in cross section with opposite legs thereof engaging said opposite surfaces of said core, said metal flange including an integral extension extending from a first of said legs and in engagement with said metal core for engaging the chamber insert to perfect the seal between the chamber insert and the cylinder block.

4,254,964

COLLAPSABLE SNOW SLED

Larry N. Gibson, Rte. 6, Box 424B, Crossville, Tenn. 38555

Filed Apr. 26, 1979, Ser. No. 33,850
Int. Cl.³ B62B *13/16*
U.S. Cl. 280—20 **7 Claims**



1. A collapsible snow sled comprising:

a rear unit having two parallel runners formed of tubing having a circular cross-section and maintained in position by a front and rear support member attached therebetween, said rear unit further including a deck member securely attached to said support members;

a front unit including a support structure, a front deck, and

steerable runner having a circular cross-section, said front deck being securely attached to said front support structure, and said steerable front runner being pivotally attached to said front support structure;

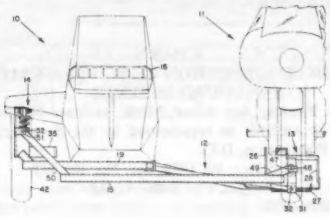
means for pivotally securing said front unit to the front support member of said rear unit at a point substantially one half of the distance between said parallel runners, and said deck such that said front unit may be folded back and between the parallel runners of said rear unit in a compact unit for storage.

4,254,965

MOTORCYCLE SIDECAR APPARATUS

George B. Kobel, 10718 Sentinel, San Antonio, Tex. 78217

Filed Apr. 30, 1979, Ser. No. 34,473
Int. Cl.³ B62R *27/12*
U.S. Cl. 280—203 7 Claims



1. A motorcycle sidecar apparatus for attaching to a motorcycle, comprising:

a motorcycle attaching bracket for securing to a motorcycle and having longitudinally spaced first pivot points located along the center line of the motorcycle wheels;

a sidecars support frame pivotally secured at one side to the longitudinally spaced pivot points for pivoting of the support frame relative to the attaching bracket;

an outboard wheel support means including a support wheel pivotally secured to the opposed other side of the support frame and having second pivot points located along the center line of the support wheel;

a linkage means pivotally secured at one end to the motorcycle attaching bracket about a third pivot point located along the center line of the motorcycle wheels;

said linkage means being pivotally secured at its other end to the wheel support means about a fourth pivot point located along the center line of the support wheel for maintaining the sidecar support frame substantially level and the inclination of the support wheel at the same inclination of the motorcycle wheels and to distribute load forces at the center lines of the support wheel and motorcycle wheels to avoid slippage and sliding of the wheels during turns.

4,254,966

ARRANGEMENT FOR COUPLING VEHICLES

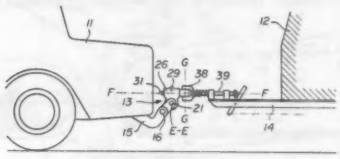
David C. Mitchell, chemin des Rasses, 1255 Veyrier, Geneva, Switzerland

Filed Jul. 5, 1979, Ser. No. 55,134
Claims priority, application United Kingdom, Jul. 5, 1978, 28894/78
Int. Cl.³ B60D *1/02*
U.S. Cl. 280—405 R 7 Claims

1. An arrangement for coupling a towed vehicle to a towing vehicle, wherein movements about the pitching, rolling and steering axes are separately accommodated, comprising:

a substantially horizontal, transverse hinge structure, having first and second parts, disposed nearest the towing vehicle for accommodating said pitching movement, said first and second parts being adapted to rotate relatively to one another with said first part being positionally fixed relative to the towing vehicle and rotatably carrying said second part;

elastic means for transmitting motion between said two parts; and,



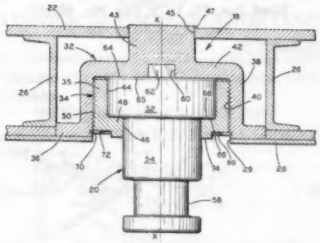
means for adjustably stressing the elastic means to bias said two parts into a desired angular relationship.

4,254,967

REMOVABLE KING PIN

Ray M. Scanlon, 429 Rosedon Dr., Montgomery, Ala. 36116

Filed Oct. 5, 1979, Ser. No. 82,196
Int. Cl.³ B62D *53/08*
U.S. Cl. 280—433 10 Claims



1. In a coupling device for removably supporting a king pin having a longitudinal axis, a support housing, a retainer housing adapted to be supported in said support housing, said retainer housing having a guide opening for receiving said king pin, and means removably connecting said retainer housing to said support housing for holding said king pin in said support housing; the improvement comprising;

means for guiding said king pin in said retainer housing opening, said guide means including

a first set of mating guide walls on said king pin and said retainer housing extending in a direction parallel to said king pin axis, and

a second set of mating guide walls on said king pin and said retainer housing extending in a direction perpendicular to said king pin axis,

means for positioning said king pin with respect to said support housing, said positioning means including a non-circular projection on said king pin, and

a non-circular opening in said support housing for receiving said non-circular projection to prevent relative rotation between said king pin and said support housing.

4,254,968

REMOVABLE BALL GUIDE ATTACHMENT FOR TRAILER HITCHES

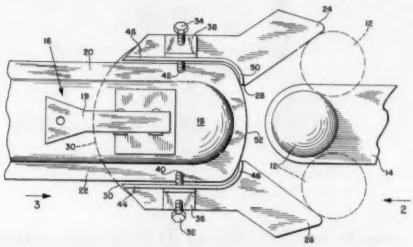
Evo DelVecchio, 2 Worcester St., Clinton, Mass. 01510

Filed Oct. 2, 1979, Ser. No. 81,098
Int. Cl.³ B60D *1/06*
U.S. Cl. 280—477 8 Claims

1. A separable attachment for the tongue of a trailer hitch to assist alignment therewith of the ball of the hitch,

said attachment including means to fix and release the same in desired location on the tongue, and

a widened access guide member facing out away from the tongue to receive the ball even if out of line with the tongue, the means to fix and release the attachment on the tongue including a fastener to selectively clamp or unclamp the attachment to the tongue.

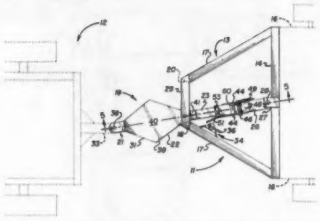


4,254,969

SLIDE LOCK TRAILER HITCH

Howard H. Martin, 500 Mart Ave., Waterford, Calif. 95386

Filed Jun. 18, 1979, Ser. No. 49,107
Int. Cl.³ B60D 1/16
U.S. Cl. 280—478 B **5 Claims**



1. A trailer hitch comprising:

a. a fore and aft elongated framework including a rear cross beam mounted on the front end of the trailer, said framework having a central longitudinal axis;

b. a draft tube pivotally mounted at its after end on said cross beam substantially on said central longitudinal axis, said draft tube extending forwardly and being swingable from side in a substantially horizontal plane;

c. a draw bar having its after portion slidably mounted within the forward portion of said draft tube for translational movement relative thereto between a first rearwardly retracted position and a second forwardly projected position;

d. latch means for detachably locking said draft tube to said bar in said first position of said draw bar, said latch means including a latch bar mounted transversely on said draw bar, a transverse latch detent pivotally mounted on said draft tube and capable of engaging said latch bar in said first position of said draw bar, and a spring biasing said latch detent toward a position of engagement with said latch bar in said first position of said draw bar, said latch means further including a lever connected to said latch detent, said lever being capable of overcoming the biasing force of said spring and removing said latch detent from said latch bar upon the application of supervening force on said lever to permit the movement of said draw bar from said first position toward said second position;

e. a transverse centering frame mounted on the forward end of said framework, said centering frame including a horizontal transverse top plate, a horizontal transverse bottom plate and a pair of vertical end plates defining with said top and bottom plates a horizontal transversely elongated aperture centered on said central longitudinal axis, said draw bar projecting forwardly through said aperture;

f. coupling means on the forward end of said draw bar for detachably connecting said draw bar to a towing vehicle; and,

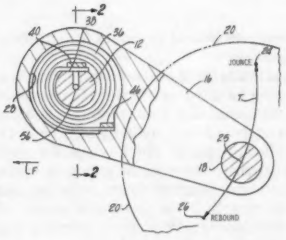
g. centering means mounted on said draw bar and engageable with said end plates of said centering frame for biasing said draw bar toward alignment with said central longitudinal axis as said draw bar is urged from said second position toward said first position and said centering means encounters said end plates, said centering means including a pair of rearwardly converging side walls mounted on the lateral sides of said draw bar, said side walls being engageable with said vertical end plates of said centering frame as said draw bar is moved through said transversely elongated aperture from said second position toward said first position.

4,254,970

VEHICLE SUSPENSION USING PRESSURIZED BOURDON TUBES

Ernest N. Petrick, Ann Arbor, Mich., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Dec. 10, 1979, Ser. No. 101,932
Int. Cl.³ B60G 11/32
U.S. Cl. 280—705 **9 Claims**



1. In a wheeled vehicle wherein each wheel is carried on a road arm swingably connected to the vehicle body: a novel suspension between the vehicle body and each roadarm, comprising a stub shaft projecting from said vehicle body for swingably mounting the roadarm; said roadarm including inboard and outboard bearings operatively engaged with the stub shaft at spaced points therealong, the roadarm space between said bearings defining an annular cavity surrounding the stub shaft; a spiral Bourdon tube operatively connected between the shaft and roadarm within the annular cavity; said Bourdon tube being a hollow tube spiralled for wind-up action as the roadarm moves toward the jounce position and unwind action as the roadarm moves toward the rebound position; and a compressible fluid filling the interior space within the tube.

4,254,971

PRESSURE-SENSITIVE RECORD MATERIAL AND PREPARATION THEREOF

Peter A. H. Isaac, Summit, N.J., assignor to Engelhard Minerals & Chemicals Corporation, Edison, N.J.

Filed Jun. 8, 1979, Ser. No. 46,811
Int. Cl.³ B41M 5/22
U.S. Cl. 282—27.5 **4 Claims**

1. As a new article of manufacture, pressure sensitive record material comprising paper coated on one surface with a white coating of particles of a finely divided alkaline pigment, said pigment being a compound of an alkaline earth, and coated on the reverse side or on the surface of a different sheet of paper

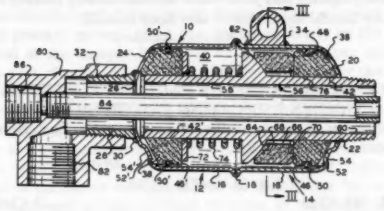
with pressure-rupturable capsules containing a solution in a polar solvent of an acid-base indicator which forms a colored anionic species when placed in contact with said particles of alkaline pigment.

4,254,972

STAINLESS STEEL ROTARY JOINT

Roger D. Wiedenbeck; Kenneth W. Boughton, and Richard Maurer, all of Three Rivers, Mich., assignors to The Johnson Corporation, Three Rivers, Mich.

Filed Jan. 4, 1979, Ser. No. 820
Int. Cl.³ F16L *27/06*
U.S. Cl. 285—61 **8 Claims**



1. A rotary joint characterized by its light weight, long life and tamper-proof construction, comprising in combination, an elongated sheet metal casing having an axis, a side wall and first and second ends defining a chamber, said casing being formed of sheet metal portions welded together and said ends being integrally formed of the sheet metal material of said side wall and extending from said side wall toward said axis, an elongated tubular nipple having an outer end extending from said casing first end and an inner end within said chamber and coaxial with said casing, attachment means defined on said nipple outer end, adapter attachment means defined on said casing second end in communication with said nipple, an annular nipple seal sealingly fixed on said nipple inner end having a sealing surface facing said casing first end, an annular first guide within said chamber adjacent said first end, sealing means defined on said first guide sealing said guide to said casing, an annular seal ring located intermediate said nipple seal and said guide sealingly engaging said nipple seal and guide, an annular second guide within said chamber adjacent said second end, sealing means defined on said second guide sealing said second guide to said casing, said guides including central cylindrical bores rotatably supporting said nipple inner end and maintained in assembly upon said nipple by said casing ends, and a compression spring circumscribing said nipple inner end located between said second guide and nipple seal biasing said nipple seal toward said seal ring and first guide to maintain sealing engagement of said seal ring with said nipple seal and said first guide.

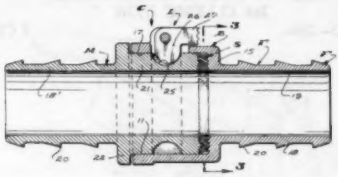
4,254,973

FLUID COUPLING SEAL

Braham Benjamin, Santa Ana, Calif., assignor to Celanese Corporation, New York, N.Y.

Filed Apr. 30, 1979, Ser. No. 34,960
Int. Cl.³ F16L *37/00*
U.S. Cl. 285—312 **6 Claims**

1. A fluid coupling including an elongate female section with front and rear ends, a central longitudinal flow passage, a socket with a cylindrical bore and a flat radial rearwardly disposed annular seat entering the rear end concentric with the bore; an annular resilient sealing ring with flat radially extending front and rear surfaces; a substantially cylindrical inner side and a cylindrical outer side; said ring is positioned in the socket with its front surface in flat engagement on said seat and its outer side engaging said bore; an elongate male section with front and rear ends, a central longitudinal flow passage, a cylindrical front end portion slidably engaged in the socket and a flat radially extending, forwardly disposed annular sealing face at the forward end of said cylindrical portion and establishing flat engagement with the rear surface of the ring; and mechanical means engaged with and between the sections, and urging and holding the male section forwardly relative to the



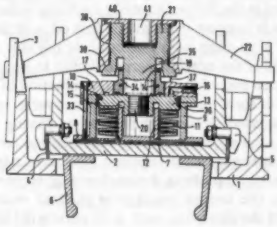
female section with said ring clamped tight between the seat and the face; and retaining means to retain the ring in the socket and including a plurality of circumferentially spaced longitudinally extending, radially inwardly projecting ribs on said bore and about which adjacent portions of the ring flow and establish tight contact.

4,254,974

BOLTING DEVICE, PARTICULARLY FOR COKE-OVEN DOORS

Rudi Rolke, Schubertstrasse 13, 4552 Herten, and Heinz Tewes, Buer-Gladbecker-Str. 65, 4660 Gelsenkirchen, both of Fed. Rep. of Germany

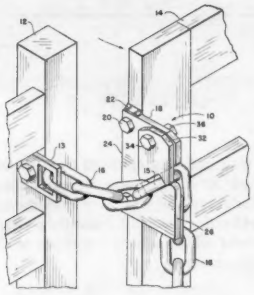
Filed Jan. 2, 1979, Ser. No. 207
Claims priority, application Fed. Rep. of Germany, Jan. 5, 1978, 2800396
Int. Cl.³ E05C *19/00*
U.S. Cl. 292—259 **15 Claims**



1. In a bolting arrangement, especially for use in coke-ovens, a combination comprising, a frame defining an opening; a door panel for closing said opening; releasable means for pressing the door panel into seating engagement with the frame and comprising a pair of hook-shaped strikes fixed to and projecting transversely spaced from each other from said frame, bolt means comprising a pair of arms projecting to opposite sides of a pivot axis, means mounting said bolt means for pivoting movement about said pivot axis and for movement in direction of the latter between a locked position engaged with said strikes and a turned unlocked position, spring means interposed between said door panel and said mounting means for pressing said door panel tightly against said frame and for urging said mounting means and said bolt means mounted thereon in axial direction away from said door panel, so that said arms will be tightly engaged with said strikes to thereby prevent said bolt means to be turned to said unlocked position; and fluid operated means for counteracting the force of said spring means arranged in contact with said mounting means and adapted to preliminarily move said mounting means with respect to said door panel under fluid pressure acting on said mounting means

to thus permit, when operated, turning of said bolt means to said unlocked position.

4,254,975
GATE LATCH APPARATUS
David A. Miller, Rte. 2, Box 213, Okmulgee, Okla. 74447
Filed Nov. 13, 1978, Ser. No. 960,302
Int. Cl.[3] E05C *17/36*
U.S. Cl. 292—264 9 Claims



1. A latching apparatus for securing closure members which are movable with respect to each other, the latching apparatus comprising:

(a) a vertically disposed first plate member, the rear edge of which is securable to one of the closure members, an elongated slot provided in the plate member, the slot being open at the front edge of the plate member;

(b) an elongated free-swinging keeper member pivotally mounted at its upper end to the first plate member above the open ended slot, a substantially right angle notch provided in the keeper member such that when the keeper member is hanging vertically, a first edge of the notch is in parallel alignment with one edge of the slot and the second edge of the notch is perpendicular to and adjacent the outer open end of the slot, the combination of the slot and the notch forming a rectangular transverse aperture; and

(c) an elongated flexible latch member having one end secured to the opposite closure member and having at least one latch engagement segment insertable within the slot such that upon pushing the latch engagement segment into the slot, the keeper member is pivoted rearwardly, the length of the slot being such as to permit the latch engagement member to be inserted into the slot by a sufficient distance to allow the keeper member to pivot forwardly to resume its vertical orientation, the second edge of the notch serving to prevent removal of the latch engagement segment without first pivotally moving the keeper member rearwardly in order to clear the slot.

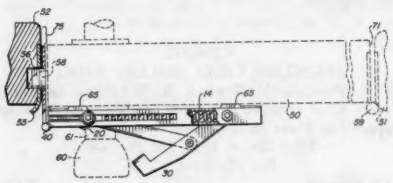
4,254,976
DOOR RESTRAINT MECHANISM
Harold A. Shoberg, 1208 E. Seldon La., Phoenix, Ariz. 85020
Filed Oct. 3, 1979, Ser. No. 81,479
Int. Cl.[3] E05C *19/18*
U.S. Cl. 292—292 9 Claims

1. A door restraint mechanism for preventing the opening of a door positioned in a doorway having a jamb, said door including a handle, comprising:

a. a frame member having a pressure face for placement against said jamb;

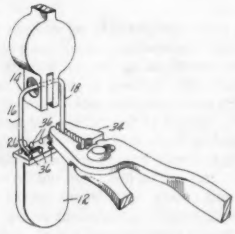
b. a door handle shoe mounted for movement along said frame and positioned on said frame between said pressure face and said door handle, and abutting said door handle; and

c. lever actuated means, secured to said frame, to apply force tending to move said pressure face and door handle shoe away from each other, and to force said pressure face



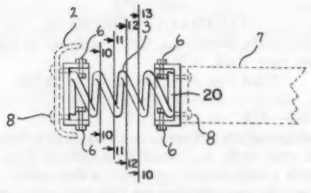
firmly against said jamb while simultaneously forcing said door handle shoe against said door handle.

4,254,977
SECURITY SEAL OF THE PADLOCK TYPE WITH TAMPER INDICATING PROTRUSIONS
Richard S. Guiler, Stewartsville, N.J., assignor to E. J. Brooks Company, Newark, N.J.
Filed Jun. 13, 1979, Ser. No. 48,029
Int. Cl.[3] B65D *33/34*
U.S. Cl. 292—320 7 Claims



1. A seal of the type resembling a padlock and comprising a plastic housing having a cavity opening to a surface thereof for receiving the leg of a wire shackle, and protuberances projecting from said surface adjacent said openings in position to be deformed by a tool used in an attempt to work the shackle leg out of the opening.

4,254,978
MULTIPLE STAGE FLEXIBLE BUMPER
Cheston L. Eshelman, 621 NE 30 Ter., Miami, Fla. 33137
Continuation-in-part of Ser. No. 822,365, Aug. 5, 1977, abandoned. This application Jun. 9, 1978, Ser. No. 914,123
Int. Cl.[3] B60R *19/06*
U.S. Cl. 293—137 7 Claims



1. In a highway type motor vehicle, a Multiple Stage Flexible Bumper comprising in combination a bumper bar mounted transversely across the front of the motor vehicle, a plurality of multiple stage telescoping coil compression springs, each com-

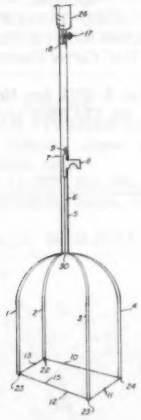
prising a primary spring and at least one helper spring, a pair of spring seats for each compression spring, means for securing the ends of the compression springs in the seats, means for securing the seats on one end of the compression springs to the vehicle frame and means for securing the seats on the other end of the compression springs to the vehicle bumper bar in longitudinal alignment by means of one end of the primary springs and the helper springs anchored firmly at the inward ends by the seats located at the longitudinal frame of the vehicle, each seat at the longitudinal frame comprising a flat base plate with an inside collar and outside collar, retainer bolts parallel to the flat base plate, located inside the last loop of wire at the spring ends, said retainer bolts passing through the outside collar and inside collar, having longitudinal mounting holes through the flat base plate for rigidly securing the flat side of the spring seat against the flat end of the vehicle frame and the outward ends of the primary springs, stage one, anchored firmly by the seats located at the bumper bar so as to have the helper springs, stage two, shorter in length and smaller in diameter than the primary springs, with the outward ends of stage two floating unattached inside the inside diameter of the primary springs stage one until they are moved against laterally or longitudinally to form a completely flexible, 360° unencumbered movement of the bumper bar around the axis of the longitudinal frame of the motor vehicle and allow the bumper bar to provide maximum protection from all types of angular collisions when the bumper bar strikes an obstruction before it or at the corner of it by means of the long coil compression springs absorbing the energy of motion into stages one and two so as to increase the resistance as the load increases causing a cushioning effect of deceleration and help prevent bent frames, broken welds and dented sheet metal in minor accidents and to help save the operator and occupants of the motor vehicle unnecessary death, injury, damage, expense and frustration in high-speed accidents.

4,254,979

SCOOP DEVICE

Marcel Bau, 89 Van Ness Ct., Maplewood, N.J. 07040

Filed Aug. 21, 1978, Ser. No. 935,716
Int. Cl.³ A01K *25/00*
U.S. Cl. 294—1 BA **3 Claims**



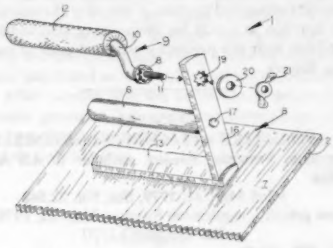
1. A scoop device comprising at least three fingers extending downwardly and outwardly from their upper ends which are adjacent one another, at least the tips of each of said fingers being bendable inwardly, means providing openings in the tips of said fingers, a string threaded through said openings to form a polygon-shaped loope, and means for tightening said loop by pulling sad string, thereby bringing said finger ends together.

4,254,980

TROWEL DEVICE

Thomas A. Anderson, 936 Highland Park Dr., Baton Rouge, La. 70808

Filed Nov. 19, 1979, Ser. No. 95,770
Int. Cl.³ B05C *11/04*
U.S. Cl. 294—15 **1 Claim**



1. A trowel device for spreading glue on a floor surface comprising:

(a) a glue spreading metal plate blade having at least one toothed edge and flat bottom surface;

(b) a support assembly comprising a member perpendicularly attached to said plate opposite said flat bottom surface;

(c) a handle arm attached to said member above and parallel to said blade, on which a hand palm can rest; and

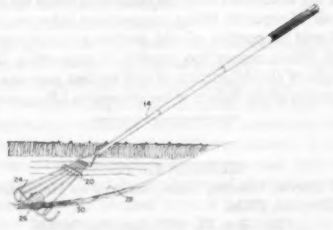
(d) a grip pressure release assembly attached to said support structure comprising an arm means positioned above and, with respect to said toothed edge, back of said handle arm to be in contact with the back of the hand of a user; said arm means having an offset and parallel threaded end section, alignment means attached to said threaded end section and having multiple aligning positioning members, and wherein said support structure member having an opening matingly matched to said alignment means and through which said alignment means can pass in rotatable fixed position.

4,254,981

GOLF BALL RETRIEVER

Albert C. Wilson, 8628 Cantore Pl., Sarasota, Fla. 33580

Filed Jun. 25, 1979, Ser. No. 51,942
Int. Cl.³ A63B *47/02*
U.S. Cl. 294—19 A **2 Claims**



1. A golf ball retriever, comprising:

(a) an elongated handle;

(b) a flat plate attached to one end of said elongated handle;

(c) a plurality of retrieving fingers, each having a straight elongated portion pivotedly attached to said flat plate and a curved portion with an uncurved outermost portion which rises from the horizontal toward said elongated handle;

(d) a sliding bar which engages each of said retrieving fin-

gers for maintaining said retrieving fingers in a spread-apart configuration having a distance between adjacent fingers which is slightly less than the diameter of a golf ball when positioned near the pivotedly attached ends of said retrieving fingers and for maintaining said retrieving fingers in a closely-spaced configuration when positioned near the free ends of said retrieving fingers; and

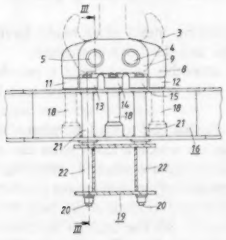
(e) a ball bearing fitted in a hemispherical depression in the straight elongated portion of one of said retrieving fingers to function as a stop for maintaining said sliding bar in a position near the pivotedly attached ends of said retrieving fingers.

4,254,982

YOKE-LIKE ATTACHMENT ASSEMBLY

Bo Borrman, Vesteras, Sweden, assignor to AB Asea-Atom, Sweden

Filed Mar. 21, 1979, Ser. No. 22,548
Claims priority, application Sweden, Mar. 22, 1978, 7803283
Int. Cl.³ B66C *1/10*
U.S. Cl. 294—81 R **8 Claims**



1. A fail-safe lifting assembly for engaging a lifting hook with a lid portion of a nuclear pressure vessel and the like, and comprising:

a pair of separate beam members each having first and second end portions adaptable for engagement with said lid portion;

first and second lug assemblies extending on either side of said lifting hook, with aligned apertures extending through each lug assembly and said lifting hook and a connecting bolt extending therethrough;

coupling means connecting a first portion of said first and second lug assemblies with one of said beam members and further connecting a second portion of said first and second lug assemblies with the remaining beam for providing a pair of separate lifting connections between said hook and said lid portion of said nuclear pressure vessel, with each lifting connection capable of supporting the entire weight of the lid portion of said nuclear pressure vessel in the event of the failure of the remaining lifting connection.

4,254,983

RETRIEVER TOOL

Allen E. Harris, Duncan, Okla., assignor to Halliburton Company, Duncan, Okla.

Filed Sep. 19, 1979, Ser. No. 76,959
Int. Cl.³ E21B *31/20*
U.S. Cl. 294—86.21 **8 Claims**

2. A retriever tool apparatus comprising:

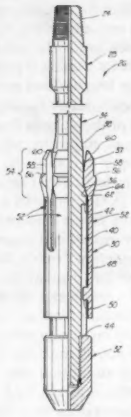
a central mandrel; and

a sleeve within which said central mandrel is slidably received, said sleeve including a plurality of upward extending spring fingers, each of said spring fingers including an upper portion, each of said upper portions including:

a downward facing tapered outer surface means for compressing said spring fingers radially inward when said retriever tool apparatus is stabbed downward through an inner bore of a device to be retrieved;

an upward facing catching shoulder means, located above said downward facing tapered outer surface means, for engaging a downward facing surface of said device to be retrieved after said retriever tool apparatus is stabbed downward through said inner bore of said device;

an arcuate substantially constant diameter outer surface



extending upward from said catching shoulder means for engaging said inner bore of said device when said upward facing shoulder means is engaged with said downward facing surface of said device; and

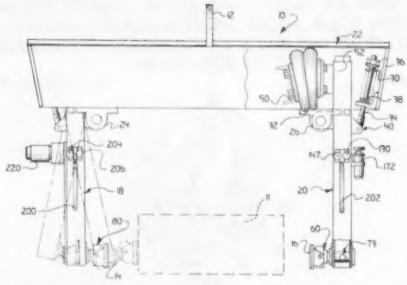
an upward facing tapered outer surface means, located above said substantially constant diameter outer surface, for guiding said substantially constant diameter outer surface from below into engagement with said inner bore of said device.

4,254,984

MOLD HANDLER

Edward D. Abraham, and Robert F. Riha, both of Brecksville, Ohio, assignors to IMC-Carver Foundry Products, Inc., Muscatine, Iowa

Filed Apr. 5, 1978, Ser. No. 893,770
Int. Cl.³ B66F *9/18*
U.S. Cl. 294—88 **11 Claims**



1. A material handling device for releasably gripping objects of various sizes, said device comprising a pair of opposed gripping pads operable between a closed position in which said gripping pads are spaced from each other a first distance and engage opposite sides of an object and an open position in which said gripping pads are spaced from each other by a

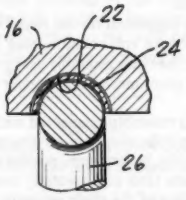
second distance larger than said first distance and in which at least one of said gripping pads is spaced from the object, spring means for urging said gripping pads away from each other and toward said open position, fluid motor means for applying a force opposed to said spring means to move said gripping pads toward said closed position when fluid pressure is applied to said fluid motor means, means for applying fluid pressure to said fluid motor means to thereby move said gripping pads toward said closed position, and adjustment means for adjusting the length of said second distance, said adjustment means including means for maintaining the pressure of the fluid supplied to said fluid motor means at an adjustable minimum whereby said fluid motor means applies at least a minimum force opposed to the force of said spring means and thereby limits the length of said second distance between said gripping pads when said gripping pads are in the open position.

4,254,985

DAMPING RING FOR ROTATING ASSEMBLIES

Frank Kirschner, East Hills, N.Y., assignor to The Soundcoat Company, Inc., Brooklyn, N.Y.

Filed Mar. 23, 1979, Ser. No. 23,319
Int. Cl.³ B60D *7/04, 17/00;* F16H *55/14*
U.S. Cl. 295—7 **6 Claims**



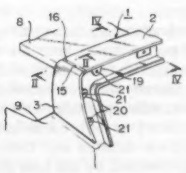
1. A vibration damping assembly for a wheel or the like that undergoes rotation comprising an annular groove in a surface of said wheel and coaxial with the axis of said wheel, a viscoelastic damping material subject to shear deformation during rotation of said wheel and positioned within said groove against the surface of said groove, and an annular metal ring positioned in said groove against said viscoelastic damping material with said damping material sandwiched between said ring and said wheel.

4,254,986

MULTI-PIECE ROOF FINISHER FOR A VEHICLE

Yoshiharu Nakamura, Koganei, Japan, assignor to Nissan Motor Company, Limited, Japan

Filed Jun. 11, 1979, Ser. No. 47,290
Claims priority, application Japan, Sep. 12, 1978, 53-125958[U]
Int. Cl.³ B62D *25/06*
U.S. Cl. 296—210 **2 Claims**



1. A roof finisher mounted over a roof panel and both side pillars of a vehicle, comprising:

a center finisher mounted across the roof panel from its one side to its other side;

two side finishers mounted one on each side pillar of the vehicle; and

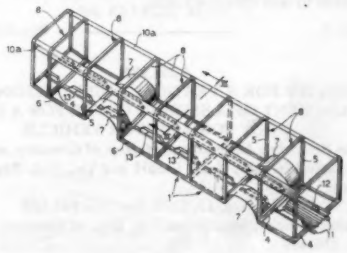
two connecting means, each of which connects a side edge of the center finisher with the upper edge of one of the side finishers, the connecting means each comprising a flange at a side edge of the center finisher, a flange at the upper edge of one of the side finishers, the flanges being placed one over the other, and at least one screw grommet, by means of which the flanges are fixed on the roof panel and are connected together, the tip of each of the screw grommets protruding into a space formed between an outer panel and an inner panel which together constitute a pillar located near the underside of the roof panel, the screw grommet being inserted through an opening formed on the upper portion of the pillar with a space being left therebetween.

4,254,987

SUPPORT STRUCTURE FOR A MOTOR BUS

Raffaele Leonardis, Turin, Italy, assignor to Centro Ricerche Fiat S.p.A., Orbassano, Italy

Filed Nov. 26, 1979, Ser. No. 97,606
Claims priority, application Italy, Dec. 19, 1978, 569896 A/78
Int. Cl.³ B62D *31/02*
U.S. Cl. 296—178 **10 Claims**



1. A support structure for a motor bus, comprising:

a plurality of modular cells connected together in a row extending in the longitudinal direction of the bus, each modular cell including:

two rectangular end frames lying in a plane extending transverse the longitudinal axis of said bus, each said end frames being constituted by:

an upper horizontal crosspiece,

a lower horizontal crosspiece,

two upright struts interconnecting respective ends of said upper and lower horizontal crosspieces to define two upper corners and two lower corners, and

a pair of upper longitudinal elements and a pair of lower longitudinal elements respectively connecting together said upper corners and said lower corners of said end frames, said horizontal crosspieces and said upright struts of said end frames being of channel section oriented with the channel thereof facing away from the other frame of said cell in the axial direction of said structure, at least some of said horizontal crosspieces and said upright struts having, at least along a substantial part thereof, respective flanges lying in a plane parallel to the general plane of the associated end frame, said flanges on said crosspieces and struts of two adjacent frames belonging to two contiguous modular cells in said support structure being welded together so that said two adjacent frames form a box-section hoop, and

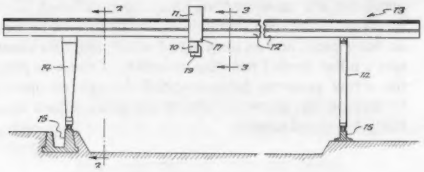
box-section reinforcing means interconnecting said modular cells together longitudinally.

4,254,988

CONSTRUCTION FOR ISOLATING CRANE CAB OPERATOR FROM CAB MOVEMENT

Douglas P. Taylor, North Tonawanda, and Raymond A. Piziali, Amherst, both of N.Y., assignors to Tayco Developments, Inc., North Tonawanda, N.Y.

Filed Dec. 7, 1978, Ser. No. 967,429
Int. Cl.[3] B60R 7/06
U.S. Cl. 296—190 20 Claims



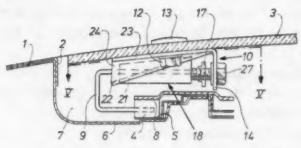
1. A crane cab suspension for isolating an operator's seat in a crane cab having upper and lower frame portions from vibrational movements of said crane cab comprising base means for mounting said seat, and pendulum means suspending said base means from said upper frame portion, said pendulum means being of a length to have a natural frequency which is lower than the frequency of vibrational movements of the crane cab to thereby effect attenuation of the transmission of crane cab vibration to said operator's seat.

4,254,989

DEVICE FOR A VERTICAL AND HORIZONTAL ADJUSTMENT OF A SLIDING COVER FOR A SLIDING ROOF FOR A MOTOR VEHICLE

Walter Schätzler, Aufhausen, Fed. Rep. of Germany, assignor to Webasto-Werk W. Baier GmbH and Co., Fed. Rep. of Germany

Filed Sep. 12, 1978, Ser. No. 941,465
Claims priority, application Fed. Rep. of Germany, Sep. 22, 1977, 2742654
Int. Cl.[3] B60J 7/04
U.S. Cl. 296—216 8 Claims



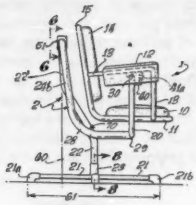
1. A device for vertical and horizontal adjustment of a sliding cover for an opening in a vehicle body member such as a sliding roof or the like of a motor vehicle, said cover being guided on each side by means of at least one guide shoe along tracks disposed on the body member, whereby the guide shoe is mounted on a guide shoe support to which the sliding cover is adjustably connected, characterized by the fact that the guide shoe support is provided with an adjusting element that is displaceable crosswise with respect to the lengthwise axis of the vehicle, said element cooperating by sloping surfaces with the sliding cover to provide height adjustment thereof and by the fact that the sliding cover is connected with said guide shoe support for lateral adjustment of said cover crosswise to the direction of sliding movement of said sliding cover, and wherein adjusting bolts are provided for displacement of the guide shoe support and adjusting element relative to the sliding cover, said bolts being disposed essentially horizontally and parallel with respect to one another and being displaceably mounted in vertical slots in a holder mounted on the cover.

4,254,990

STABILIZED OSCILLATING CHAIR

Eugene M. Kelley, 1796 Larkspur, Pomona, Calif. 91766

Filed Mar. 13, 1979, Ser. No. 20,051
Int. Cl.[3] A47C 1/00
U.S. Cl. 297—273 9 Claims



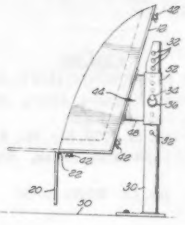
1. A stabilized oscillating chair comprising:
base means,
a column extending upwardly from the base,
a seat assembly comprising a bottom portion, a back portion and a pair of arm rests, one on either side and above the bottom portion,
a yoke assembly supported on the upper end portion of the column for relative roll rotation, said yoke assembly extending under the chair assembly seat portion and upward to engage roll pivot means at the upper end portion of the column,
the column being rotatably connected with the base for yaw rotation of the yoke assembly relative to the base, and
said yoke assembly having arm portions extending under each of said arm rests and pivotally connected therewith for pitch rotation of the chair assembly.

4,254,991

CUSHIONED SEAT FOR POWERBOAT

George I. Venieris, 13900 Marquesas Way, Apt. D-111, Marina Del Rey, Calif. 90291

Filed Jan. 25, 1979, Ser. No. 6,417
Int. Cl.[3] A47C 1/00
U.S. Cl. 297—345 2 Claims



1. An impact shock absorbing lean chair apparatus mounted in an ocean-going power speed boat for mitigating impact shocks to a crew member due to impacts of the boat with ocean swells and waves, whereby the crew member leans against the lean chair in a semi-standing position, with knees slightly bent, part of each impact shock to the crew member being absorbed by the legs of the crew member and the remainder of each impact shock being absorbed by the lean chair apparatus, the lean chair apparatus comprising:
upstanding support means attached to the boat;
a seat interconnected to the upstanding support means at a vertical height selected so that the crew member will be in the semi-standing position when the crew member leans against the seat, the seat comprising:

a crew member back support portion having a lower edge;

a crew member posterior receiving portion extending outwardly from the back support portion for absorbing and mitigating ocean wave and swell impact shocks to the crew member, the posterior receiving portion having a relatively narrow width between the lower edge of the back support portion and the edge of the posterior receiving portion for providing only partial posterior support of the crew member when the crew member's back is positioned against the back support portion, the remaining impact shock absorption for the crew member being provided by the crew member's partially bent legs;

a first side member positioned adjacent to and along one side of the back support portion and the posterior receiving portion;

a second side member positioned adjacent to and along the other side of the back support portion and the posterior receiving portion, the back support portion, posterior receiving portion, the first side portion and the second side portion defining an interior surface of the seat;

a support flange interconnected between the seat and the upstanding support means for attaching the seat to the upstanding support means; and

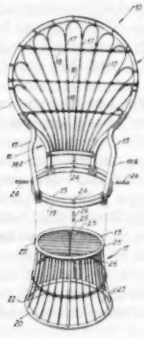
adjustment means for moving the first and second sie members relative to the back support and posterior receiving portions to vary the distance between the interior surface portions of the first and second side members, the side members interconnecting the posterior receiving portion to the back support portion at a location on the posterior receiving portion remote from the back support portion.

4,254,992

KNOCKDOWN RATTAN CHAIR

Jose S. Orosa, P.O. Box 456 MCC, Makati, Metro Manila 3117, Philippines

Filed Jan. 8, 1979, Ser. No. 1,713
Int. Cl.³ A47C *4/02*
U.S. Cl. 297—440 **1 Claim**



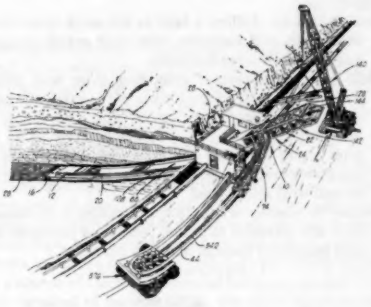
1. As a new article of manufacture, a plurality of knockdown rattan chairs, each comprised of a preformed seat member and a preformed back member, a plurality of said seat members and a plurality of said back members being nested in stacks for shipping, said seat members each having an upper circular frame and a circular base of greater diameter than said frame, said base and frame being interconnected by vertical ribs and reenforced by an intermediate circular base, said ribs being disposed in converging direction from said base frame to said upper frame, said plurality of seat members being nested in mutually partially overlapping relation to define said stack, the total height of which is less than the combined heights of the unnested seat members, a plurality of preformed back members made of rattan, each adapted to be detachably superimposed on a said seat member, said back members each having a circular base and a back frame of substantially circular shape defining a back rest and opposed arm rests fixedly secured on said circular base, said arm rests of said back members converging in the direction of said circular bases of said back members, said plurality of back members being nested in mutually partially overlapped relation to define a composite stack the total height of which is less than the combined height of said back members, said circular base of said back members being dimensioned snugly to encompass the upper circular frame of said seat members, said upper frames of said seat members and said circular bases of said back members each having a plurality of spaced holes adapted to be disposed in horizontal alignment with each other when said upper frames are disposed within said circular bases, and a plurality of dowel pins sized to be detachably and snugly fitted in each of said aligned holes whereby a said seat member from said nested stack and a said back member from said nested stack may be rigidly connected with each her.

4,254,993

MINING APPARATUS

Dean A. McGee, Oklahoma City; James E. Ingle, Edmond, both of Okla., and Alan J. Lane, Lexington, Mass., assignors to Kerr-McGee Corporation, Oklahoma City, Okla.

Continuation-in-part of Ser. No. 768,650, Feb. 14, 1977, Pat. No. 4,160,566. This application Jun. 21, 1979, Ser. No. 50,693
Int. Cl.³ E21C *41/04*
U.S. Cl. 299—10 **1 Claim**



1. A method for forming a borehole in an earth formation utilizing a miner having a forward cutter and a rearward cutter, comprising the steps of:

moving the miner into the earth formation;

excavatingly engaging the earth formation with the forward cutter to form a forward cutter borehole having a width and a height with the width being greater than the height;

steering the miner through the earth formation by positioning the forward cutter while moving the miner into the earth formation;

withdrawing the miner from the earth formation;

excavatingly engaging the earth formation generally adjacent the forward cutter borehole while moving the miner into the earth formation to form a rearward cutter borehole having a width and a height with the width being greater than the height, the rearward cutter borehole intersecting the forward cutter borehole and the width of the rearward cutter borehole being less than the width of the forward cutter borehole; and

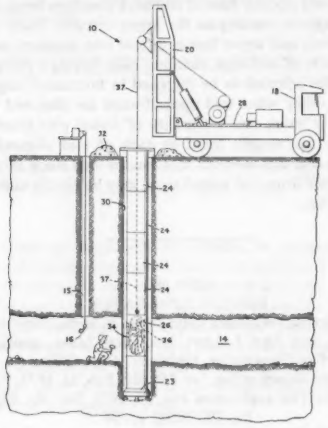
maintaining the forward cutter within the forward cutter borehole to steeringly guide the miner while withdrawing the miner from the earth formation.

4,254,994

METHOD OF AN APPARATUS FOR GAINING ACCESS TO AN UNDERGROUND CHAMBER

Donald J. McBride, Denville, N.J., assignor to New Jersey Drilling Co., Inc., Netcong, N.J.

Filed Jun. 8, 1978, Ser. No. 913,547
Int. Cl.[3] E21F *11/00*
U.S. Cl. 299—12 11 Claims



1. Apparatus for gaining access to an underground chamber, comprising:

drill means for drilling a hole in the earth from the earth's surface to said chamber, said drill means comprising a pneumatically operated drill;

drill pipe casing means extending from said drill means through said hole to the surface of the earth, the interior of said drill pipe casing means defining a personnel passage and said drill pipe casing means comprising an air-tight pipe casing such that said drill pipe casing means defines the compressed air supply line for providing operating air to said drill means; and

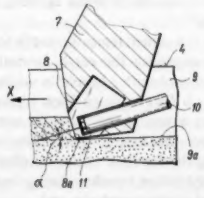
means for placing said personnel passage in communication with said chamber to permit passage of personnel between said personnel passage and said chamber.

4,254,995

PROCESS OF AND AN ARRANGEMENT FOR MINING

Kuno Guse, Dortmund, and Josef Schmitjans, Bochum, both of Fed. Rep. of Germany, assignors to Bochumer Eisenhutte Heintzmann GmbH & Co., Bochum, Fed. Rep. of Germany

Filed Mar. 8, 1979, Ser. No. 18,672
Claims priority, application Fed. Rep. of Germany, Mar. 25, 1978, 2813142
Int. Cl.[3] E21C *27/16, 37/06*
U.S. Cl. 299—17 22 Claims



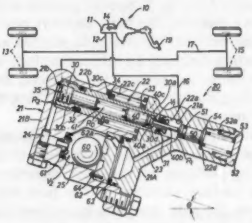
1. A process of mining, comprising the steps of cutting with a cutting edge of a cutting tool into a surface of material to be mined whereby fissures develop in the region of the bottom of the cut; and directing through apertures in the cutting tool adjacent said cutting edge jets of high pressure fluid medium forming an angle between 5–20 degrees with said bottom of the cut so that such jets enter onto said fissures and act as hydraulic wedges.

4,254,996

FLUID PRESSURE CONTROL DEVICE FOR VEHICLE BRAKING SYSTEMS

Tomoyuki Nogami, Toyota, Japan, assignor to Toyoda Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Nov. 16, 1979, Ser. No. 94,751
Claims priority, application Japan, Nov. 20, 1978, 53-143115
Int. Cl.[3] B60T *8/14*
U.S. Cl. 303—6 C 6 Claims



1. In a fluid pressure control device for incorporation in a vehicle braking system between a master cylinder and a wheel brake cylinder, which device comprises:

a housing for mounting on a vehicle body structure, said housing being provided with an inlet port for connection to said master cylinder, an outlet port for connection to said wheel brake cylinder, a stepped bore having small and large diameter portions respectively in communication with said inlet and outlet ports, and an inner bore formed in parallel with said stepped bore and communicating at one end thereof with the small diameter portion of said stepped bore and at the other end thereof with the large diameter portion of said stepped bore;

a stepped piston axially reciprocable within said stepped bore to form first and second fluid chambers communicating with said inlet and outlet ports respectively, said stepped piston including a smaller end exposed within the small diameter portion of said stepped bore and a larger end exposed within the larger diameter portion of said stepped bore; a spring biasing said piston, in the axial direction thereof, toward said outlet port; and

a cut-off valve including a valve seat provided within said inner bore to permit the flow of fluid between the first and second fluid chambers, and an inertia-concontrolled valve element housed within said inner bore to co-operate with said valve seat to block the flow of fluid from the first chamber to the second chamber when said valve element is subjected to a deceleration in excess of a predetermined value;

the improvement comprising:

a bypass passage provided through the axis of said stepped piston and communicating at the opposite ends thereof into the first and second chambers;

a bypass valve including a valve seat provided within said bypass passage to permit the bypass flow of fluid between the first and second chambers, a valve member axially movable within said bypass passage to co-operate with said second-named valve seat, and a second spring biasing said valve member, in the axial direction thereof, toward the first chamber to close said bypass valve; and

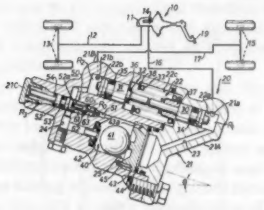
an extension rod extending from said valve member into the first chamber and being engageable with the inner wall of said stepped bore to open said bypass valve against biasing force of said second spring.

4,254,997

FLUID PRESSURE CONTROL DEVICE FOR VEHICLE BRAKING SYSTEMS

Tomoyuki Nogami, Toyota, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Nov. 21, 1979, Ser. No. 96,318
Claims priority, application Japan, Nov. 28, 1978, 53-146827
Int. Cl.[3] B60T 8/14
U.S. Cl. 303—6 C 4 Claims



1. A fluid pressure control device for incorporation in a vehicle braking system between a master cylinder and a wheel brake cylinder comprising:

a housing provided with an inlet port for connection to said master cylinder, an outlet port for connection to said wheel brake cylinder, and a valve chamber communicating at one end thereof with said inlet port and at the other end thereof with said outlet port;

inertia-controlled valve means including a first valve seat provided within said valve chamber to permit the flow of fluid between said inlet and outlet ports therethrough, and an inertia-controlled valve element housed within said valve chamber to co-operate with said first valve seat to cut off the flow of fluid from said inlet port to said outlet port when said valve element is subjected to deceleration in excess of a predetermined value;

a bypass passage to permit direct fluid flow from the upper part of said valve chamber into said outlet port;

check vaive means including a second valve seat provided within said bypass passage, a valve member co-operating with said second valve seat to interrupt the direct flow of fluid from said valve chamber to said outlet port, and a first spring biasing said valve member toward said second valve seat to close said check valve means;

a piston axially slidable within a bore extending co-axially with said bypass passage and being exposed at an inner end thereof to pressure of the flow of fluid between said first valve seat and said outlet port, and a second spring biasing said piston toward said valve member, the resilient force of said second spring being larger than that of said first spring, and wherein said piston is engaged with said valve member to open said check valve means for allowing direct flow of fluid from said valve chamber to said outlet port until the pressure acting on said piston reaches a predetermined value, said piston being retracted by the pressure acting thereon against said second spring to close said check valve means prior to closing of said inertia-controlled valve means.

4,254,998

TRAILER SWAY-CONTROL AND BRAKING SYSTEM

John J. Marshall, Grand Rapids, Mich., and James M. Kilchenman, North Webster, Ind., assignors to Epco Mobilehome Products, Inc., Marshall, Mich.

Filed Oct. 30, 1978, Ser. No. 955,942
Int. Cl.[3] B60T 13/06
U.S. Cl. 303—20 23 Claims

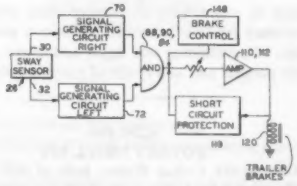
1. Apparatus for selectively applying the brakes of a trailer while being towed by a towing vehicle comprising:

first means for sensing lateral oscillatory motion of said trailer and for generating separate right and left acceleration signals in response to right and left acceleration. respectively of said trailer,

second means for producing a sway-inhibiting signal in response to both of said right and left acceleration signals which successively occur in a time shorter than a predetermined period of time,

third means for producing a brake control signal in response to said sway-inhibiting signal,

said second means including two signal-generating circuits responsive to said right and left accelerating signals, respectively, to produce two logic signals, respectively, means for combining said logic signals to produce a single sway-inhibiting signal only when said logic signals occur simultaneously within said period of time said logic signals being in the form of unidirectional voltages, said combining means being responsive to simultaneous occurrence thereof to produce said sway-inhibiting signal only when the combined unidirectional voltages exceed a predetermined magnitude, said combining means being a logic AND circuit having two input circuits and an output circuit, said two input circuits being connected to said two signal-generating circuits, respectively, to receive the logic signals thereof, each signal-generating circuit including a signal-holding circuit which maintains said logic signal for a predetermined time interval and terminates said logic signal after such time interval, each said signal-holding circuit including a charging capacitor and resistor in parallel, each signal-generating circuit having input and output circuits, said first means including two switch devices individually coupled to the input circuits, respectively, of said signal-generating circuits and being actuable in response to lateral motion of said trailer, said output circuits, respectively, being connected to the input circuits of said logic AND circuit, each of said signal-generating circuits including two series coupled operational amplifiers, a source of threshold potential being connected to one input terminal of each amplifier, the other input terminal of the first amplifier being connected to one of said switch devices and the other input terminal of the second amplifier being coupled to the output terminal of the first amplifier, said capacitor having one side connected to said other input terminal of said second amplifier, and said logic AND circuit including a resistance connected between the output terminals of the second amplifiers of the two signal-generating circuits with a tap on said resistance serving as a part of said logic AND circuit.



4,254,999

DIE SHOES WITH STANDARD INTERCHANGABLE COMPONENTS AND METHOD FOR INTERCHANGABILITY

James D. Davidson, 67 Grantour Ct., Pontiac, Mich. 48055

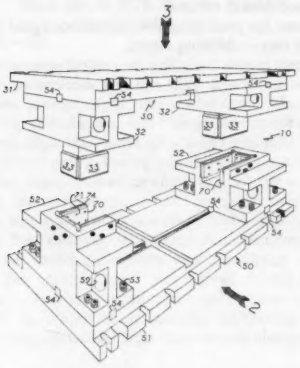
Filed Sep. 4, 1979, Ser. No. 72,142
Int. Cl.[3] F16C 29/02, 29/12
U.S. Cl. 308—3 A 14 Claims

1. A die construction commonly called die shoes, consisting of a lower shoe combination and an upper shoe combination, comprising:

a lower shoe base plate;

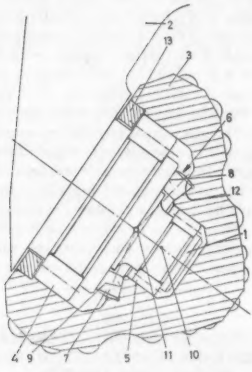
at least one wear plate housing;

a means of maintaining said lower shoe components in a stationary mode of precision alignment;
an upper shoe base plate;
at least one heel post component;



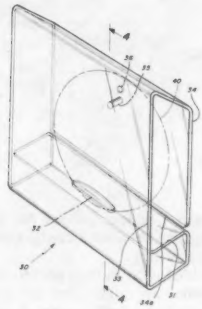
a means of maintaining said upper shoe components in a stationary mode of precision alignment; and
a means of maintaining said upper and lower shoe combinations parallel and in a mode of precision alignment.

4,255,000
ROTARY DRILL BIT
Armin Olschewski; Lothar Walter, both of Schweinfurt; Manfred Brandenstein, Eussenheim; Heinrich Kunkel, Schweinfurt, and Gösta Norlander, Surte, all of Fed. Rep. of Germany, assignors to Sandvik AB, Fack and Aktiebolaget SKF, Gothenburg, both of, Sweden
Filed Jul. 20, 1979, Ser. No. 59,452
Claims priority, application Fed. Rep. of Germany, Sep. 23, 1978, 7828401[U]
Int. Cl.[3] F16C *19/32*
U.S. Cl. 308—8.2 6 Claims



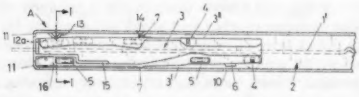
1. A rotary drill bit assembly comprising a trunnion and at least one rotary cutter mounted on the trunnion, bearing means supporting the rotary cutter on the trunnion comprising at least one radial bearing and at least one axial roller bearing comprised of conical rollers, at least one of the bearing races of the axial roller bearing disposed perpendicular to the axis of rotation of the rotary cutter and the complementary bearing race being conical, and a guide rim associated with one of said bearing races which guides the conical rollers in a radial outward direction.

4,255,001
DISPLAY CASE
Daniel Frishman, Andover, Mass., assignor to Akko, Inc., Lawrence, Mass.
Filed Dec. 14, 1978, Ser. No. 969,419
Int. Cl.[3] A47G *19/08;* A47F *3/00;* B65D *5/50*
U.S. Cl. 312—114 1 Claim



1. A plate showcase formed of a continuous integral length of transparent plastic having a single width, with one end of said plastic folded to form an elongated base having an upper surface with plate retaining means formed therein, said retaining means comprising a slot adapted to prevent lateral movement of said plate within the showcase, and with the other end of said sheet of plastic shaped to form a protective cover with means integral therewith supporting said plate at an angle of substantially 75° to 85° said support means projecting generally horizontally from and fixed to said protective cover.

4,255,002
PULL-OUT GUIDE FOR DRAWERS
Erich Röck, Höchst, and Bernhard Mages, Dornbirn, both of Austria, assignors to Julius Blum Gesellschaft m.b.H., Höchst, Austria
Filed Mar. 20, 1979, Ser. No. 22,359
Claims priority, application Austria, Mar. 30, 1978, 2221/78
Int. Cl.[3] A47B *88/16;* F16C *21/00*
U.S. Cl. 312—348 20 Claims



1. A pull-out guide assembly for use on each of opposite sides of a drawer in an article of furniture of the type wherein a drawer is slidably insertable and removable from a furniture body, said pull-out guide assembly comprising:
means associated with the drawer for forming a horizontal channel defined by upper and lower spaced horizontal surfaces;
a supporting rail adapted to be mounted on the body, said supporting rail having a horizontal flange adapted to extend outwardly from the body and into said channel between said upper and lower channel surfaces;
at least two roller means, positioned for rolling contact on said flange and said upper and lower channel surfaces for taking up vertical forces between said supporting rail and

said means forming said channel when the drawer is positioned within the body;

said roller means being mounted within and supported by a carriage which is mounted within said channel and which is longitudinally movable with respect to said channel and said supporting rail;

said carriage, said channel and said flange being dimensioned such that said carriage is unitarily and completely tiltable in a single direction within said channel about a horizontal axis transverse to the longitudinal direction of said channel only when said supporting rail and said channel are relatively longitudinally moved to a maximum drawer pull-out position;

said carriage having adjacent a first end thereof locking means operable in cooperation with a first of said channel surfaces for locking said carriage within said channel only when said supporting rail and said channel are moved to said maximum drawer pull-out position; and

said carriage having adjacent a second end thereof clamping means for laterally grasping opposite sides of a projection extending into said channel from a second of said channel surfaces only when said supporting rail and said channel are moved to said maximum drawer pull-out position.

4,255,003

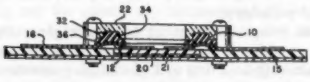
ELECTRICAL CONNECTOR

William E. Berg, Beaverton, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.

Division of Ser. No. 861,066, Dec. 15, 1977, Pat. No. 4,150,420, which is a continuation of Ser. No. 631,591, Nov. 13, 1975, abandoned. This application Jan. 29, 1979, Ser. No. 7,445

Int. Cl.³ H05K *1/12*

U.S. Cl. 339—17 LM **8 Claims**



1. An electrical connector for electrically interconnecting a conductive path of a first circuit element with a conductive path of a second circuit element, said connector comprising:

(a) a resilient member having an undulating surface including a concave portion interposed between two convex portions;

(b) a contact member defining a flexible metallic sheet conforming in cross-section to said undulating surface of said resilient member, one surface of said sheet including a concave portion interposed between two convex portions; and

(c) means for securing said contact member in conforming contact with said surface of said resilient member;

(d) said resilient member being so formed that, when said connector is forced against said circuit elements such that respective convex portions of said contact member touch said conductive paths, further force producing movement of said connector in a direction directly toward said circuit elements causes said convex portions of said metallic sheet to wipingly engage said conductive paths so as to form an electrical connection therebetween.

4,255,004

ELECTRICAL JUNCTION BOX

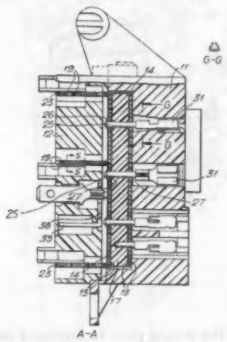
Friedrich J. A. Kourimsky, Bensheim, and Lothar H. W. Nix, Walldorf, both of Fed. Rep. of Germany, assignors to AMP Incorporated, Harrisburg, Pa.

Filed May 22, 1979, Ser. No. 41,460

Claims priority, application United Kingdom, May 30, 1978, 24081/78

Int. Cl.³ H01R *9/00, 23/72*

U.S. Cl. 339—17 E **3 Claims**



1. An electrical junction box comprising:

a two-part insulating housing having opposed spaced-apart internal faces,

an insulating carrier base between said opposed faces, a pair of terminal boards on said carrier base,

each of said terminal boards being proximate to one of said faces, each said terminal board having conductive metal strips thereon,

contact pins mounted in said carrier base, said terminal pins being selectively connected to said conductive metal strips and having means thereon proximate to, and accessible from, one surface of said housing for making connections to external circuitry,

at least some of said conductive strips having end portions which extend perpendicularly of the planes of said circuit boards and towards surface portions of said housing, said end portions being located in channels, said channels being integral with said housing, said channels and said end portions being dimensioned to receive a multi-contact connector.

4,255,005

ELECTRICAL CONNECTOR ASSEMBLY

Yukio Fukunaga, Yokohama, Japan, assignor to Nissan Motor Company, Limited, Yokohama, Japan

Filed May 30, 1979, Ser. No. 43,685

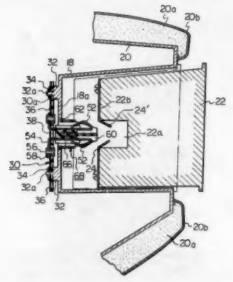
Claims priority, application Japan, Jun. 2, 1978, 53-66978

Int. Cl.³ H05K *1/12*

U.S. Cl. 339—17 C **4 Claims**

1. In a vehicular instrument panel assembly including an instrument panel having on one side thereof a pocket, an instrument to be mounted in said pocket, an electric device located at the other side of said instrument panel, and an electrical connector assembly by which said instrument and said electrical device are brought into electrical connection when said instrument is properly mounted in said pocket, said connector assembly including a socket member arranged on said instrument and having a number of terminals electrically connected to said instrument, a plug member arranged on said instrument panel and having an insulating housing disposed in an opening formed in the bottom wall of said pocket and a number of terminal elements housed in said housing, each of said terminal elements having opposed first and second end portions and

being arranged in said housing with said second end portion projecting into said pocket so that when said instrument is properly mounted in said pocket, said second end portions of said terminal elements are brought into contact with the terminals of said instrument accomplishing the electrical connection therebetween, the improvement comprising a rigid printed wiring plate mounted on a rear end wall of said pocket, said plate having therein an aperture aligned with said opening of the bottom of said pocket and having thereon wiring foil strips which are connected to said electric device and terminate near



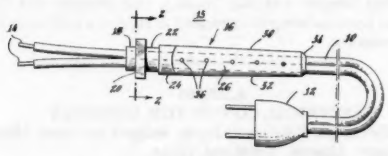
the aperture of the wiring plate to surround the same, said first end portions of said terminal elements extending through said aperture of said wiring plate to be respectively and directly connected to the terminating ends of said wire foil strips, said insulating housing of said plate member being fixed in an aligned position relative to said aperature of said printed wiring plate by means of a pair of locking arms extending from opposite end walls of said insulating house, said locking arms having hooked ends which are engageable with locking holes formed in said printed wiring plate beside said aperture.

4,255,006

STRAIN-RELIEF MEMBER FOR REDUCING TORSIONAL STRAINS IN LINE CORD

Robert R. King, Maplewood, N.J., assignor to Conair Corporation, Edison, N.J.

Filed Jun. 11, 1979, Ser. No. 46,999
Int. Cl.³ H01R *13/56*
U.S. Cl. 339—58 **9 Claims**



1. A strain-relief member for use with an electrical two-conductor power supply cord at the point said cord enters the cord opening in the housing of a hand-held personal care electrical appliance to reduce torsional stresses, said strain-relief member including:

a body surrounding said cord and having an inner annular flange and an outer portion,

said flange surrounding said power supply cord internally of said housing and being shaped to complementarily fit within said housing to prevent rotation therein,

said outer portion integral with said flange and extending outwardly from said housing and around said cord,

said outer portion having a cylindrical cross-section adjacent said housing, and having rounded and flattened portions removed from said housing giving said body a generally elliptical cross-section, said flattened portions being on opposite sides and proximate to the flat, two-conductor power supply cord and said rounded sections being on opposite sides and each being proximate to a single conductor of the power supply cord,

said flattened portions being uniformly tapered inwardly from said adjacent cylindrical cross-section outer portion to the end remote from said housing,

said body being molded about said cord and being made of elastomeric material of such softness that torsional stresses are substantially uniformly distributed throughout the tapered length of said body,

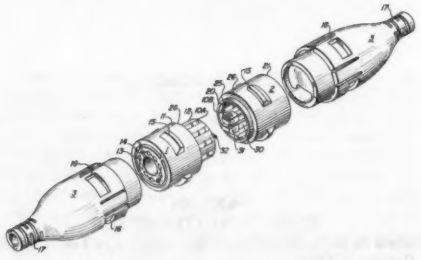
whereby likelihood of fracture of said power supply cord due to torsional and other stresses is reduced by distributing said forces substantially uniformly along said strain-relief member.

4,255,007

MULTI-TERMINAL ROTARY CONNECTOR

Leonard H. Michaels, Warrenville; Garry W. Thompson, Bensenville, and Richard Zic, Chicago, all of Ill., assignors to TRW Inc., Elk Grove Village, Ill.

Filed May 12, 1978, Ser. No. 905,274
Int. Cl.³ H01R *13/62, 25/12*
U.S. Cl. 339—88 R **15 Claims**



1. A multi-terminal biparte rotary connector assembly including

a first plug member having a generally circular first mating end with a generally cylindrical outer periphery;

a plurality of electrical contacts on said first end, each of said contacts having an apex portion exposed radially outward of said periphery;

a second receptacle member having a generally circular opening with a cylindrical inner periphery in a mating end to mate with said first end of said plug member;

one of said members including means defining at least one aperture in the mating end thereof for receiving anti-separation and polarization attachment means in a singular orientation;

anti-separation and polarizing attachment means extending from the mating end of the other of said members for insertion into said aperture means of said one of said members and rotation with respect to said aperture means to releasably lock said plug member and receptacle member in singular oriented mated contact with one another; and

a plurality of electrical contacts on the inner periphery of said opening in said receptacle member, each of said latter contacts having an apex portion exposed radially inward of said inner periphery and disposed such that the plug contacts engage the receptacle contacts only when said attachment means is received into said aperture means and said members are rotated with respect to one another to said locked position, the apex portions of each of said engaging contacts including a generally rounded contacting surface and a raised contact portion extending above the respective rounded surface thereof, said raised contact portion of abutting pairs of said contacts spaced from one another to contact said rounded contacting surface of an opposed contact of the other member when said members are in said locked position, said contacts interfering with

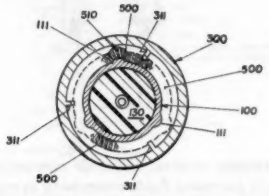
and sliding past one another as said members are rotated to said locked position to thereafter inhibit counter-rotation.

4,255,008

ELECTRICAL CONNECTOR ASSEMBLY HAVING ANTI-DECOUPLING DEVICE

Gene L. Snyder, and David W. MacAvoy, both of Bainbridge, N.Y., assignors to The Bendix Corporation, Southfield, Mich.

Filed Aug. 31, 1979, Ser. No. 71,463
Int. Cl.[3] H01R *13/639*
U.S. Cl. 339—89 M 13 Claims



1. In an electrical connector assembly comprising:

a first shell having an insert with a plurality of axial passages;

a second shell having an insert with a plurality of axial passages, said second shell having thread means on a portion of the outside of said second shell;

a plurality of pin-type electrical contacts, each mounted in a respective axial passage of one of said inserts;

a plurality of socket-type electrical contacts, each mounted in a respective axial passage of the other of said inserts, said socket-type electrical contacts arranged in the other insert in the same manner as the pin-type electrical contacts are arranged in the first insert and matable with said pin-type electrical contacts;

a coupling nut for selectively connecting and maintaining said first and second shells together and holding said pin-type and socket-type electrical contacts together in a mated position, said coupling nut having an end wall, mounted for rotational movement on said first shell with thread means connectable with the thread means on the second shell for connecting the first and second shells together with the pin-type and socket-type electrical contacts held in mated relationship; and

means for constantly and consistently retarding the rotational movement of the coupling nut relative to the first and second shells regardless of the position of the coupling nut and direction of rotation thereof relative to said shells, the improvement wherein said retarding means comprises:

at least one stop member extending inwardly from the coupling nut;

a flange formed about the first shell;

at least one boss on the first shell intermediate said flange and said end wall of the coupling nut; and

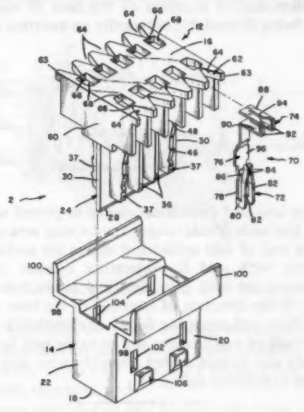
a helical spring wrapped about the first shell intermediate said flange and said end wall, said stop member protruding between and abutting individual ajacent coils of said helical spring to secure said spring in nonrotational relationship to the coupling nut and said boss distending portions of said spring wrapped thereover to provide sufficient frictional contact between the spring and the first shell to retard rotational movement of said first shell relative to said coupling nut.

4,255,009

TWO ROW ELECTRICAL CONNECTOR

Donald R. Clark, York, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Jul. 30, 1979, Ser. No. 62,207
Int. Cl.[3] H01R *11/20*
U.S. Cl. 339—97 P 8 Claims



1. In an electrical connector having a housing body; elongated electrical terminals, each having a contact portion and a wire connecting portion; and a cover, partially assembled with said housing body, and, following electrical connection of electrical wires to said wire connecting portions, fully assembled with said housing body to cover said wire connecting portions, said connector characterized in that:

said housing body includes a rib and a plurality of barriers disposed along the length of said rib and defining laterally adjacent, elongated cavities having open sides facing outwardly away from said rib,

said terminals being force fit between said barriers and disposed lengthwise along said cavities and supported lengthwise against said rib,

each said wire connecting portion includes a pair of plate like members, having outer ends facing outwardly away from said rib toward a respective said channel open side and being joined by spaced apart straps on either side of slots defined in said plate like members from said outer ends thereof and along said plate like members toward said rib,

said cover being slidable lengthwise over said cavities,

said housing body having first latching means for latched registration with a first portion of said cover partially assembled over the open sides of cavities and engageable with a second portion of said cover assembled over said cavities and covering said wire connecting portions of said terminals.

4,255,010

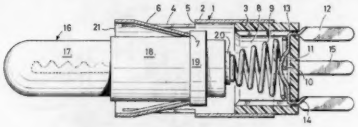
LAMP SOCKET ASSEMBLY

Eugenie L. Jullien, Paris, France, assignor to Compagnie Internationale d'et de Realisations Electrotechniques, Paris, France

Filed Jun. 18, 1979, Ser. No. 49,303
Claims priority, application France, Mar. 13, 1978, 78 07138
Int. Cl.[3] H01R *17/04*
U.S. Cl. 339—176 L 6 Claims

1. A socket assembly for a lamp having a cylindrical base provided with a first electrical contact at the end thereof and with a second electrical contact in the form of a continuous radially extending annular flange, said socket assembly comprising a metallic cylindrical sleeve having an inner diameter

larger than the outer diameter of said base so that said base is spaced from said cylindrical sleeve, said cylindrical sleeve being open at one end for axial insertion of the base of said lamp, three tongues cut from said cylindrical sleeve and bent to extend resiliently from a point adjacent said one end inwardly at an angle to the axis thereof, said tongues being spaced uniformly from each other and having free ends facing oppositely to the direction of insertion of the base of said lamp, said tongues being distendable outwardly on insertion of the base of



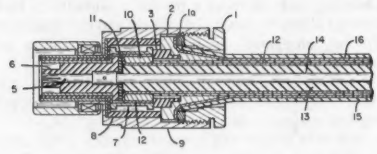
said lamp into said cylindrical sleeve to permit said flange to pass the free ends of said tongues and spring means mounted at the other end of said cylindrical sleeve for making electrical connection with said first electrical contact comprising a sleeve acting on said first electrical contact in a direction opposite to the direction of insertion of the base to uniformly bias said base and cause the flange to electrically engage with the free ends of said tongues and to cause said lamp to center and firmly seat in said socket assembly with said base spaced from said cylindrical sleeve.

4,255,011

TRANSMISSION LINE CONNECTOR

William W. Davis, Rosemount, and Ernest S. Griffith, St. Louis Park, both of Minn., assignors to Sperry Corporation, New York, N.Y.

Filed Apr. 2, 1979, Ser. No. 26,267
Int. Cl.³ H01R *17/08*
U.S. Cl. 339—177 R **2 Claims**



1. A connector for making an electro-mechanical connector with a multi-conductor transmission line having a concentrically related center conductor, a first dielectric insulator surrounding said center conductor, an inner braid and a second dielectric insulator surrounding said inner braid, comprising:

a body assembly adapted to receive said transmission line;

a cylindrical inner shield mountably contained within said body assembly and adapted to making a solder connection to said inner braid;

a first centrally aperatured dielectric spacer mountably contained within said inner shield;

a center contact mountably contained within said central aperature of said first spacer and having means for making electrical contact with said center conductor;

a bushing through which said inner braid is inserted and folded back over the exterior surface of said bushing for protecting said transmission line during the soldering of said inner braid to said inner shield, said bushing mountably contained within said inner shield and abutting said first spacer;

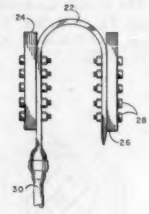
means abutting said bushing means and adapted to said body assembly for compressively securing said inner braid within said inner shield between said first spacer and said bushing means and for compressively securing said second dielectric insulator to said body assembly, thereby securing the electrical connections of said center conductor and inner braid against axial and lateral movements of said transmission line and improving the small signal characteristics of said connector.

4,255,012

CORROSION RESISTANT ELECTRODE CONNECTOR ASSEMBLY

Richard G. Parent, Waltham, and Irving D. Elyanow, Lexington, both of Mass., assignors to Ionics, Incorporated, Watertown, Mass.

Filed Jun. 25, 1979, Ser. No. 51,665
Int. Cl.³ H01R *11/02*
U.S. Cl. 339—242 **6 Claims**



1. A corrosion resistant electrode connector assembly for immersion in corrosive fluids comprising in combination:

a. an electrically conducting core of substantially flattened pipe;

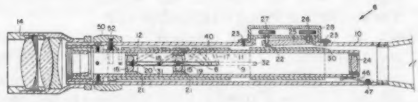
b. a corrosion resistant protective jacket of substantially flattened pipe selected from the group consisting of titanium or columbium, tightly fitted over said core in close mechanical contact with said core over the entire inner surface of said jacket, said assembly closed at one end and open at the opposite end, said assembly having an unflattened portion of said core and said jacket at said open end, said core protruding from said jacket at said open end, said assembly having a plurality of holes transverse the broad surface of said assembly.

4,255,013

RIFLE SCOPE HAVING COMPENSATION FOR ELEVATION AND DRIFT

Ralph G. Allen, Floresville, Tex., assignor to John E. McNair, Aurora, Colo.

Filed May 17, 1979, Ser. No. 40,071
Int. Cl.³ G02B *7/10, 27/32*
U.S. Cl. 350—10 **11 Claims**



1. A variable magnification power rifle scope constructed along an axis comprising:

a housing adapted to be attached to a gun;

a lens tube movably mounted in said housing and having rotatable means to longitudinally position lens means in said tube for varying magnification;

cam means operable by said rotatable means;

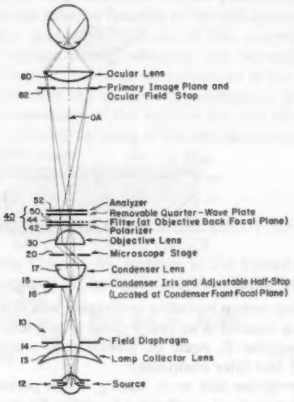
said cam means providing non-linear longitudinal movement of a contact point against a cam surface for tilting line of sight in response to said rotatable means; and

adjustable means for changing said tilt of said line of sight by adjusting said cam surface to adapt said scope to different rifle/cartridge combinations and to facilitate sighting in of said scope.

4,255,014
EDGE ENHANCEMENT OF PHASE PHENOMENA

Gordon W. Ellis, Media, Pa., assignor to Research Corporation, New York, N.Y.

Filed Jul. 20, 1977, Ser. No. 817,486
Int. Cl.[3] G02B 21/14
U.S. Cl. 350—13 56 Claims



1. Apparatus for forming an image of an object by irradiating said object to form undiffracted radiation and diffracted radiation comprising:

a lens for forming an image of the object;

means for obliquely irradiating the object with radiation incident on the object predominantly from one side so that at least a substantial portion of the undiffracted radiation is directed through a first portion of a rear focal plane of the lens and at least a substantial portion of only one sideband of the diffracted radiation is directed through the remainder of the rear focal plane of the lens, said means comprising:

means for forming a beam of radiation which is diverging at the front focal plane of a condenser lens and is not a point source at said plane and

a circular aperture and a substantially opaque object located substantially at said front focal plane and defining a substantially semi-circular aperture; and

in the rear focal plane of said lens, or an image thereof, means for attenuating at least one of said sideband and the undiffracted radiation, said means dividing said rear focal plane, or image thereof, into only two regions through which image-forming radiation is transmitted, the image formed by the undiffracted portion of the beam being incident on substantially all of the first of said regions and only on said first region and the single sideband of the diffracted portion being incident on the second region.

4,255,015
MEANS FOR COUPLING A FIBER OPTIC CABLE WITH AN ELECTRO-OPTIC TRANSDUCER

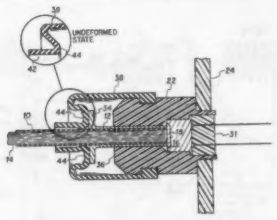
Washington Adams, Richardson, and Kenneth J. Miller, Plano, both of Tex., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Sep. 1, 1978, Ser. No. 939,013
Int. Cl.[3] G02B 5/14
U.S. Cl. 350—96.20 4 Claims

1. Means for coupling a fiber optic cable with an electro-optic transducer, comprising:

a ferrule for terminating the cable, said ferrule having a flange a predetermined distance from the end thereof which end coincides with the end of the cable;

a housing for mounting on a planar surface, said housing having a passageway therethrough transverse to the surface when mounted to accomodate the insertion therein of the ferrule from one end and the electro-optic transducer via an opening in the surface from the opposite end, the length of the passageway being such that the distance between the passageway entrance to said ferrule and the electro-optic transducer when positioned in said passageway is less than said predetermined distance so that said



flange cannot contact said housing upon insertion of said ferrule;

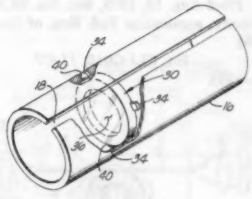
a cover for mounting over said housing, having a passageway to accommodate the cable and integral means formed in the interior thereof for exerting a spring force on said flange when mounted, and

latching means provided on said housing and cover to maintain their union upon mounting.

4,255,016
FIBER OPTIC CONNECTOR

Leslie M. Borsuk, Los Alamitos, Calif., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Jul. 2, 1979, Ser. No. 53,711
Int. Cl.[3] G02B 5/14
U.S. Cl. 350—96.21 12 Claims



1. A fiber optic connector comprising:

a support body having a passage therethrough;

a pair of fiber optic ferrules each having an optical fiber therein;

a ring;

a film extending across said ring and being secured thereto;

said film having an index of refraction similar to, but not necessarily matching, that of the fibers;

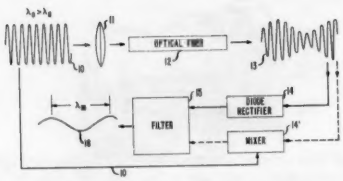
means supporting said ring in said passage in a plane extending normal to the longitudinal axis of said passage; and

said ferrules being mounted in the opposite ends of said passage each abutting against said film.

4,255,017
TUNABLE SOURCE OF COHERENT ELECTROMAGNETIC RADIATION BASED ON MODULATIONAL INSTABILITY

Akira Hasegawa, New Providence, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murry Hill, N.J.

Filed Dec. 14, 1979, Ser. No. 103,449
Int. Cl.³ G02B 5/14; H02M 5/04
U.S. Cl. 350—96.29 13 Claims



1. A method for generating coherent electromagnetic radiation comprising:

(a) coupling essentially constant amplitude, coherent electromagnetic radiation at a first frequency into a single mode transmission medium adapted to transmit radiation at the first frequency, the medium having at least one frequency region of anomalous dispersion, and

(b) separating electromagnetic radiation at a second frequency different from the first frequency from the radiation after the radiation has propagated through the transmission medium,

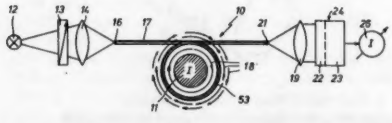
CHARACTERIZED IN THAT

the carrier frequency is chosen to lie within the region of anomalous dispersion of the transmission medium, thereby achieving efficient generation of coherent electromagnetic radiation at least at the second frequency.

4,255,018
FIBRE OPTICAL ARRANGEMENT FOR MEASURING THE INTENSITY OF AN ELECTRIC CURRENT

Reinhard Ulrich, Leonberg, Fed. Rep. of Germany, and Scott C. Rashleigh, Sydney, Australia, assignors to Max-Planck-Gesellschaft zur Forderung der Wissenschaften e.V., Leonberg, Fed. Rep. of Germany

Filed Aug. 13, 1979, Ser. No. 66,282
Claims priority, application Fed. Rep. of Germany, Aug. 16, 1978, 2835794
Int. Cl.³ G01R 15/07
U.S. Cl. 350—375 14 Claims

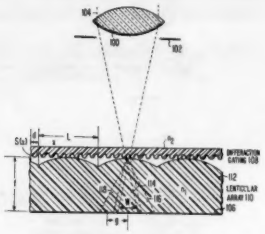


1. A fiber optical arrangement for measuring the intensity of an electric current using the Faraday effect, in which the path of light for the light whose state of polarization is influenced by the magnetic field surrounding the conductor through which current flows is marked by the core of an optical fiber which is coiled round the conductor in a number of turns, the optical fiber used in the arrangement being one which has a circular double refraction α at least of the order of magnitude of a linear double refraction β determined by the structure of the fiber and its coiled arrangement.

4,255,019
DIFFRACTIVE COLOR FILTER

Karl H. Knop, Zurich, Switzerland, assignor to RCA Corporation, New York, N.Y.

Filed Apr. 9, 1979, Ser. No. 28,368
Int. Cl.³ G02B 27/46
U.S. Cl. 350—162 SF 13 Claims



1. A diffractive color filter for use in a polychromatic-light imaging system including an imaging lens and a photosensitive surface situated in an image plane of said lens, said lens having an f-number F_c equal or greater than a minimum f-number F_c^{min}; said filter comprising:

a lenticular lens array having a lens periodicity L, a focal length f and an effective f-number F_L proportional to f/L, said array being adapted to be situated with its focal plane substantially in coincidence with said photosensitive surface,

a diffractive structure situated substantially in proximity to said array, said diffractive structure including a phase grating having a predetermined grating profile S(x) and grating line spacing d, where d is larger than a certain wavelength γ of said polychromatic light, and

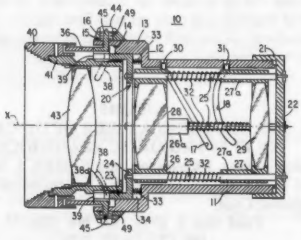
wherein the following relationship exists:

$$F_c^{min} \geq d/\gamma$$

4,255,020
ZOOM LENS SYSTEM CAPABLE OF MACROPHOTOGRAPHY

Katahira Yukio, Sayama, Japan, assignor to Osawa Precision Industries, Ltd., Tokyo, Japan

Filed Jul. 3, 1979, Ser. No. 54,505
Claims priority, application Japan, Jul. 3, 1978, 53-080678
Int. Cl.³ G02B 7/10
U.S. Cl. 350—430 25 Claims



1. In a variable focal length optical system having an optical axis and including a cam tube disposed in camming engagement with lens operating means which is coupled to a variator lens and a compensator lens for accommodating mutual axial movements thereof, wherein one of the cam tube and the lens operating means is rotatable with respect to the optical axis for

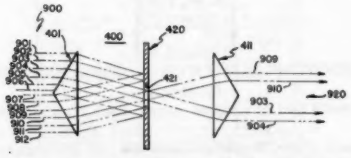
effecting coordinated cammed axial movements of the variator lens and the compensator lens with respect to the cam tube for focusing in a normal range between a telephoto condition and a wide angle condition, the improvement for focusing in a macrophotographic range comprising control means coupled to the cam tube and shiftable between a normal range condition and a macrophotographic range condition, said control means in the normal range condition thereof preventing axial movement of the cam tube for focusing of the optical system in the normal range, said control means in the macrophotographic range condition thereof effecting axial movement of the cam tube in response to rotational movement of the rotatable one of the cam tube and the lens operating means thereby to alter the axial movement of the variator lens and the compensator lens for effecting focusing of the optical system in the macrophotographic range.

4,255,021

OPTICAL DEVICE WITH CONICAL INPUT AND OUTPUT PRISM FACES

Barry S. Brunsden, Chicago, Ill., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Apr. 20, 1979, Ser. No. 31,809
Int. Cl.³ G02B 5/04
U.S. Cl. 350—286 **11 Claims**



1. A system for selectively separating portions of radiation from a beam of substantially parallel radiation having a beam central axis and perimeter comprising a conical input prism face transparent to the radiation, a conical output prism face transparent to the radiation and longitudinally spaced apart from said input prism face and extending oppositely thereto, each of said input and output prism faces being discrete entities facing outwardly and having a perimeter circular in transverse cross section, and means associated with said prism faces for selectively separating portions of the radiation beam at the perimeter and adjacent thereto having at least a part thereof opaque to the radiation and positioned intermediate said input and output faces, said prism faces being longitudinally spaced apart a predetermined distance such that radiation entering said input prism at the perimeter thereof is concentrated toward the output prism face central axis and radiation entering said input prism face at the central axis is dispersed toward the output prism face perimeter thereby radially translating the beam to permit access to the central portion of the original beam at the perimeter of the translated beam and adjacent thereto.

4,255,022

METHOD OF AND APPARATUS FOR EXAMINATION OF VISUAL FIELDS

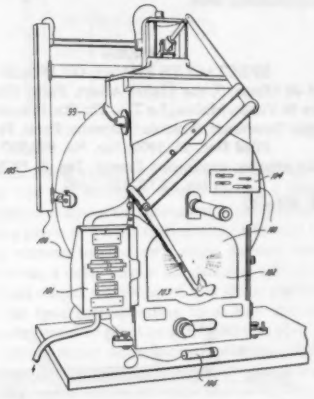
Christian L. Kuether, Houston; Robert E. Williams, Pearland; Thomas A. Decker; Charles Kurtzman, both of Houston, all of Tex.; Kenneth T. Richardson, Anchorage, Ak., and Richard A. Harrison, Houston, Tex., assignors to Baylor College of Medicine, Houston, Tex.

Filed Oct. 2, 1978, Ser. No. 948,115
Int. Cl.³ A61B 3/06
U.S. Cl. 351—24 **8 Claims**

1. An apparatus for retrofitting a projection type ophthalmic visual fields testing instrument having a movable test light controlled by a movable mechanical arm for projecting a test stimulus comprising,

an array board positioned adjacent the mechanical arm having a multiplicity of visual indicators spatially arranged in a composite pattern of testing points required for at least one ophthalmic testing procedure including kinetic visual fields testing for a visual fields instrument,

a processor connected to the array board for sequentially actuating said indicators in accordance with said testing procedure, said processor having a memory,



a manually actuated cursor mounted on the mechanical arm including a sensor indicating when the cursor is aligned with an actuated visual indicator,

means connected to said test light for actuating said light when the sensor on the cursor is aligned with an actuated indicator, and

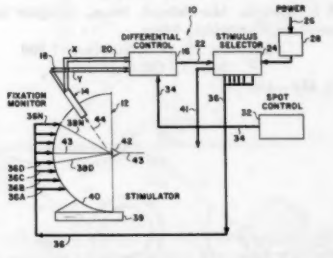
a patient's response switch connected to the memory for recording the patient's response to the light stimulus.

4,255,023

OBJECTIVE RETINAL RESPONSE RECORDER

Harold D. House, Suite 1010, Kelly Prof. Bldg., 6565 S. Yale, Tulsa, Okla. 74136

Filed Feb. 12, 1979, Ser. No. 11,375
Int. Cl.³ A61B 3/06
U.S. Cl. 351—24 **15 Claims**



1. In an apparatus for making a non-manual, objective retinal response display, responsive to light stimulus to a human eye; an improved apparatus for providing a selected light stimulus, at selected positions relative to the retinal axis, comprising;

(a) stimulator means comprising means to supply, on command, a selected one, of a selected plurality of possible beams of light, each positioned so as to enter the lens of an eye of a patient positioned on the axis of said stimulator, at

a difficult selected angle to the axis of said stimulator; and means to position the eye of a patient on the axis of said stimulator means;

(b) machine readable spot control memory means for storing in selected order each of the position parameters of said selected plurality of beams of light; and

(c) in which said selected beams of light are produced by means of small reflecting surfaces positioned at selected locations on the surface of said stimulator, and a focused beam of light reflected from a small mirror near the axis of said stimulator adapted to be rotated selectively about two perpendicular axes.

4,255,024

SPECTACLES FRAME OF WOOD

Thibaut de Monts, 7, rue Maitre Albert, Paris, France (75005); Herve de Varax, Malieu, La Tour Du Pin, France (38110), and Jacques Gourvenec, 5 rue de Charonne, Paris, France (75011)

Filed Dec. 26, 1978, Ser. No. 972,937

Claims priority, application France, Jan. 3, 1978, 78 00032

Int. Cl.³ G02C *5/00*

U.S. Cl. 351—41 **13 Claims**

1. A spectacles frame comprising:

a plurality of elongated thin resilient wood slats arranged in superposed relation and adhesively secured together to define a laminated support frame shaped to define spaced lens loops lying generally in a plane, the laminations of said support frame lying generally perpendicular to said plane; and

there being at least one discontinuity in each of said loops whereby said loops may be resiliently expanded to receive lenses therein.

4,255,025

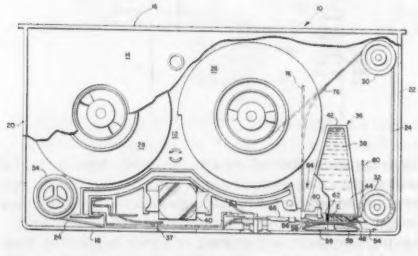
METHOD AND APPARATUS FOR COVERING SEALING SURFACE ON SEALING DEVICE OF FILM CASSETTE PROCESSOR

Donald E. Moodie, Marblehead, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Aug. 20, 1979, Ser. No. 67,900

Int. Cl.³ G03C *11/00*

U.S. Cl. 352—130 **8 Claims**



1. In a film cassette containing photographic film strip movable in a given direction in accordance with winding of the film strip on a film spool, a fluid processor constructed to store processing fluid and having an opening allowing passage of the processing fluid for deposition onto the film strip, and a sealing strip having a sealing surface sealing the opening, the sealing strip having a leading end connectable to the film strip for movement therewith so as to release the fluid and carry the sealing strip into the spool winding for storage, the improvement comprising:

a flap portion connected to the sealing strip and arranged to overlie the sealing surface as the sealing strip is drawn toward the film spool so as to cover the sealing surface when the sealing strip is convolutely wound with the film strip and thereby preclude the processing fluid carried by the sealing surface from adversely affecting the film strip.

4,255,026

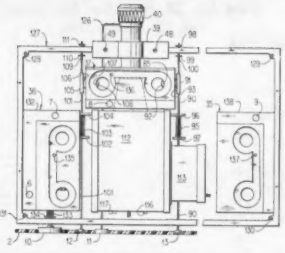
VIEWER

Warren R. Ebener, Jr., 1616 Terrace View Dr., West Columbia, S.C. 29169

Filed Dec. 26, 1979, Ser. No. 107,410

Int. Cl.³ G03B *23/12, 1/58, 21/02*

U.S. Cl. 353—26 R **10 Claims**



1. A device for use by a person for viewing material on a film comprising:

(a) a viewing screen secured within said device;

(b) a projection module secured within said device;

(c) a cartridge containing film;

(d) a cartridge module operable to hold said cartridge, optically aligned with said projection module, and secured to said device;

(e) lens means secured to said device, optically aligned with said projection module and said cartridge module, and operable to focus said material directly onto said viewing screen;

(f) first toothed gear means secured to said cartridge operative when moved to advance said film in said cartridge a pre-determined distance;

(g) second toothed gear means secured to said cartridge operative when moved to reverse said film in said cartridge a pre-determined distance;

(h) third toothed gear means secured within said cartridge module and extending through an end of said cartridge module, operative when moved to mesh with said first toothed gear means thereby advancing said film;

(i) fourth toothed gear means secured within said cartridge module and extending through the other end of said cartridge module, operative when moved to mesh with said second toothed gear means thereby reversing said film in said cartridge;

(j) first gear moving means positioned within said device, operative to move said third toothed gear means, thereby advancing said film a pre-determined distance, when activated by said person;

(k) second gear moving means positioned within said device, operative to move said fourth toothed gear means, thereby reversing said film a pre-determined distance, when activated by said person; and

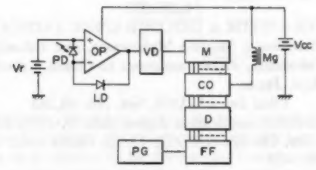
(l) a cartridge rewind module secured within said device and operative to rewind said film in said cartridge, said cartridge rewind module comprising:
(1) a spring-wind knob;
(2) first rewind assembly gear means operative to be moved by said spring-wind knob;
(3) a rewind spring assembly aligned with said first rewind assembly gear means and operative to store energy within said rewind spring assembly;
(4) a shaft secured to said rewind spring assembly;
(5) a rewind spring locking bar operative to secure said shaft;
(6) release means operative to release said rewind spring locking bar thereby allowing said energy stored within said rewind spring assembly to be released by the turning of said shaft; and
(7) a second rewind assembly gear means secured to said shaft whereby when said release means releases said energy from said rewind spring assembly, said shaft rotates moving said second rewind assembly gear means which meshes with said second gear means which is secured to said cartridge thereby rewinding said film in said cartridge.

4,255,027

EXPOSURE CONTROL DEVICE FOR PHOTOGRAPHIC CAMERA

Saburo Numata, Urawa, Japan, assignor to Fuji Photo Optical Co., Ltd., Omiya, Japan

Continuation of Ser. No. 690,724, May 27, 1976, abandoned. This application Apr. 26, 1979, Ser. No. 33,499
Claims priority, application Japan, May 30, 1975, 50-64945
Int. Cl.³ G03B *7/093*
U.S. Cl. 354—23 D **2 Claims**



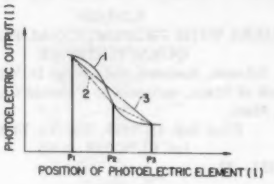
1. An exposure control device for a camera comprising a light measuring circuit for measuring the scene brightness and giving an analogue output indicative of the scene brightness, a voltage-digital converter connected with the light measuring circuit for converting the analogue output voltage of the light measuring circuit to a digital value, a memory circuit connected with the voltage-digital converter for memorizing the digital output thereof, a digital pulse generator for generating digital pulses, a flip-flop circuit means connected with the digital pulse generator for counting the digital pulses therefrom to develop a digital count value, a digital decoder connected with the flip-flop circuit means for log-converting the digital count value from the flip-flop circuit means to derive a log-converted digital output, and a digital comparator connected with said memory circuit and said decoder for comparing the digital output memorized by the memory circuit and the log-converted digital output from the digital decoder so as to generate an output when the level of the log-converted digital output from the digital decoder equals that of the digital output memorized by the memory circuit.

4,255,028

FOCUS DETECTING DEVICE IN CAMERA

Harumi Aoki, Kiyose, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 9, 1979, Ser. No. 65,250
Claims priority, application Japan, Aug. 24, 1978, 53-103214
Int. Cl.³ G03B *3/10*
U.S. Cl. 354—25 **6 Claims**



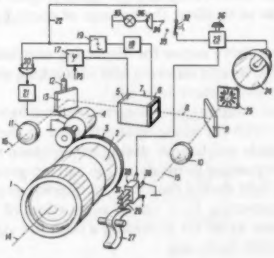
1. A focus detecting device in a camera comprising: a single self-scanning type photoelectric device having a number of elements disposed at a position equivalent to the position of the image forming plane of a lens; a drive circuit for driving said photoelectric element to produce a single discrete time series output waveform; a delay circuit for delaying said single discrete time series output waveform of said single photoelectric element by the time corresponding to at least the scanning period for one element to produce a delayed waveform; signal processing circuit means determining variations of said delayed waveform and said discrete time series output waveform in one scanning period of said photoelectric device, wherein an output difference between said elements is detected as an unfiltered discrete photoelectric transducing output, and a maximum output is provided when proper focalization is obtained.

4,255,029

FOCUSING DEVICE

Otto Freudenschuss, Vienna, Austria, assignor to Karl Vockenhuber and Raimund Hauser, both of Vienna, Austria

Filed Aug. 20, 1979, Ser. No. 68,130
Claims priority, application Switzerland, Sep. 4, 1978, 9272/78
Int. Cl.³ G01J *1/36*; G03B *3/10*
U.S. Cl. 354—25 **16 Claims**



16. In a focusing device for the focusing movement of at least one member of an objective lens, with a passive range finding device comprising at least one photoelectric transducer device which is arranged on the axis of an optical system, by which transducer device in dependency on the contrast of the scene to be photographed, which scene is illuminated by the ambient light, a signal is able to be produced (passive range finding) and with an evaluation device for the signal which is produced by the photoelectric transducer device, by which evaluation device a special evaluation signal is produceable

with insufficient contrast of the object to be photographed, the improvement comprising

transmitting means for emitting an (active) range finding wave packet onto the object to be photographed,

switching means for switching said transmitting means by the special evaluation signal,

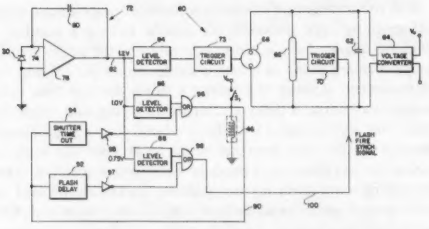
the optical system includes a reflection mirror, said reflection mirror has a surface of controllable reflectivity.

4,255,030

CAMERA WITH PROPORTIONAL FILL FLASH QUENCH STROBE

Bruce K. Johnson, Andover, and George D. Whiteside, Lexington, both of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed Sep. 13, 1979, Ser. No. 74,993
Int. Cl.[3] G03B *15/05*
U.S. Cl. 354—27 **9 Claims**



1. A photographic apparatus of the type having means for defining a film plane and an optical path for transmitting light from a scene along the optical path to expose photosensitive film located in the film plane together with a system for controlling the firing of an electronic flash of the quench type under conditions of either substantial or negligible ambient scene light intensity, said apparatus comprising:

a blade mechanism;

means for mounting said blade mechanism for movement between a blocking arrangement in which said blade mechanism is in light blocking relation with respect to the optical path so as to preclude scene light from being transmitted along the optical path to the film plane and an unblocking arrangement in which said blade mechanism is in light unblocking relation with respect to said optical path so as to allow the passage of scene light to the film plane;

actuatable drive means for displacing said blade mechanism between its said blocking and unblocking arrangements to define an exposure interval;

means for detecting and integrating scene light in correspondence with the scene light admitted to the film plane by said blade mechanism during an exposure interval;

means responsive to the detection and integration of ambient scene light during the exposure interval to one signal level corresponding to a select proportion of a determined exposure value for providing a flash fire signal to fire the electronic flash; and

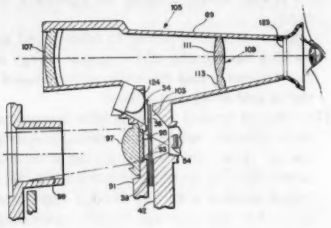
means responsive to the detection and integration of both ambient and artificial scene light to a given signal level greater than said one signal level for actuating said drive means to displace said blade mechanism from its said unblocking arrangement to its said blocking arrangement so as to terminate said exposure interval and to the detection and integration of both ambient and artificial scene light to a signal level greater than said given level for quenching the artificial light from said electronic flash so that the artificial light from said flash contributes substantially the remaining proportion of said determined exposure value.

4,255,031

PHOTOGRAPHIC CAMERA WITH DUAL PURPOSE LIGHT INDICATOR

Bruce K. Johnson, Andover; George D. Whiteside, Lexington, and Arthur G. LaRocque, Belmont, all of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Continuation-in-part of Ser. No. 960,062, Nov. 13, 1978, Pat. No. 4,192,587. This application Jan. 2, 1979, Ser. No. 487
Int. Cl.[3] G03B *7/097, 17/20*
U.S. Cl. 354—53 **10 Claims**



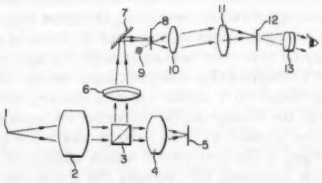
1. In a photographic camera apparatus of the type having an automatic exposure control system responsive to manual actuation for automatically providing a photographic exposure cycle comprising a plurality of sequentially occurring exposure influencing events, the improvement comprises: a single source of artificial light, light control means for sequentially energizing said light source in correspondence with at least two of the exposure influencing events, and means for directing the light from said light source from said camera apparatus so that it may be viewed from outside the camera by a photographer to enable him to determine whether at least one of said two exposure influencing events has been completed in order to proceed with the exposure cycle and for thereafter directing the light from said light source to a location within said camera to provide a light control signal input to the automatic exposure control system in correspondence with the other one of said two exposure influencing events.

4,255,032

CAMERA WITH A HOLOGRAPHIC INDICATOR

Kazuya Matsumoto; Susumu Matsumura, and Takashi Suzuki, all of Yokohama, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 25, 1979, Ser. No. 60,283
Claims priority, application Japan, Jul. 27, 1978, 53/92234
Int. Cl.[3] G03B *17/20, 13/02;* G03H *1/22*
U.S. Cl. 354—53 **3 Claims**



1. A camera having a holographic indicator comprising:

objective lens means for forming an image of an object on recording means;

exposure control means for determining the amount of exposure of said recording means; and

a view finder including:

a image forming optical system for directing the light from said object along a path and forming a second image of said object on an image plane;

a relief type blazed hologram for recording the information

of the indicating mark and having a transmitting factor high enough for the second image of the object to be observed and a diffraction efficiency high enough for the reconstructed image to be observed, said relief type blazed hologram having a diffraction grating condition wherein phase factor α defined by the difference in refractive indexes between said hologram and the ambient contacting therewith multiplied by $\pi\Delta/\lambda$ is not more than 0.56, where Δ is the height of relief and λ is the wavelength of incident ligh, whereby the zero-order diffraction factor of the hologram for the light from the object is higher than 90%;

carrying means for holding said relief type blazed hologram in said path of light from the object;

illuminating means arranged out of said path for illuminating said hologram to obtain a reconstructed image of the indicating mark on the same plane as that of the second image of the object; and

optical means for viewing the reconstructed image and the second image;

said illuminating means being arranged to illuminate the hologram from such a direction in which the transmitting light through the hologram passes out of the path of said optical means, and said hologram having a spatial frequency which causes the light from the reconstructed image to pass through said optical means and each diffracted light from the object to pass out of said optical means.

4,255,033

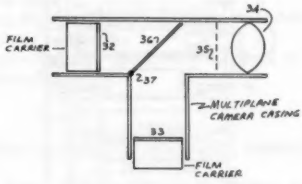
UNIVERSAL FOCUS MULTIPLANAR CAMERA

Gordon M. Rose, 27 Heathgate, London NW11 7AP, England

Filed Feb. 23, 1979, Ser. No. 14,651

Int. Cl.³ G03B *35/00, 33/10;* **B44C** *3/02*

U.S. Cl. 354—110 **8 Claims**



1. In a single camera or optical device a means for causing the image formed by the single conventional lens system of that camera or device to be divided into two or more whole sub-images, each sub-image falling upon a different plane at the same instant of time, and with each plane purposely moved to be at a different distance from the lens system and any of the other planes at that instant, for producing finished still or motion pictures or continuous television signals of each sub-image so formed at each different plane, such that those pictures or signals differ only as to the sharpness of focus of different objects at different ranges from the single objective lens system.

4,255,034

FILM RETENTION IN CARTRIDGE ASSEMBLY

Frederick W. Harvey, Webster, and Gurdip S. Sethi, Rochester, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Dec. 26, 1979, Ser. No. 106,629

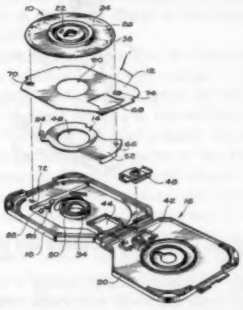
Claims priority, application European Pat. off., Aug. 8, 1979, 79-102786.5

Int. Cl.³ G03B *17/32*

U.S. Cl. 354—121 **10 Claims**

1. In a photographic cartridge assembly of the type including (1) an opaque casing, a wall of which has an exposure window, and (2) a film unit mounted in the casing for movement in a film advancing direction relative to the casing such that successive portions of the film unit align with the exposure window, the improvement comprising:

a cover member including an opaque region, said cover member being mounted in the casing between the wall and the film unit for movement, independent of the film unit, between a closing position in which said opaque region is aligned with and closes the exposure window, and an



opening position in which said opaque region is out of alignment with and opens the exposure window;

means associated with the film unit and said cover member for inhibiting movement of the film unit in its film advancing direction when said cover member is in its exposure window closing position; and

means for disabling said movement inhibiting means when said cover member is in its exposure window opening position.

4,255,035

RING ELEMENT FOR CAMERA MECHANISM

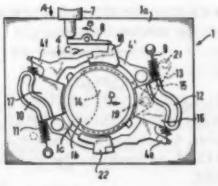
Karl-Heinz Lange, Bunde, Fed. Rep. of Germany, assignor to Balda-Werke Photgraphische Gerate und Kunstosoff GmbH & Co., KG, Bunde, Fed. Rep. of Germany

Filed Sep. 13, 1979, Ser. No. 74,928

Claims priority, application Fed. Rep. of Germany, Sep. 13, 1978, 2839788

Int. Cl.³ G03B *9/08*

U.S. Cl. 354—230 **14 Claims**

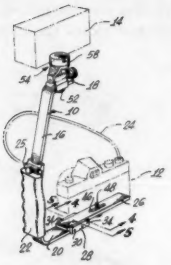


1. A ring-shaped element for a camera mechanism comprising a substantially ring-shaped member formed from a metal sheet dimensioned to cooperate with a fixed substantially cylindrical member of the camera for rotation of the ring about the axis of the cylindrical camera member, said ring formed with operating regions of a synthetic material which are molded to provide engagement means for operative engagement with activating means of the camera, at least two operating regions anchored on the ring member and formed with a sliding surface for cooperating with the wall of the cylindrical member when the ring is rotated in relation to the axis of the cylindrical member.

4,255,036
HANDHELD SUPPORT FOR CAMERA AND PHOTOGRAPHIC LAMP

Vincent J. Pincetich, 18332 Lahey St., Northridge, Calif. 91324

Filed May 25, 1979, Ser. No. 42,316
Int. Cl.[3] G03B *17/56*
U.S. Cl. 354—293 3 Claims



1. A handheld support for a camera and photographic lamp comprising:

a generally C-shaped member having a vertical center section and upper and lower horizontal arms extending therefrom, said upper arm defining a slot extending longitudinally therealong;

said center section including a handle adapted to be grasped by one hand, said handle having a row of vertically spaced finger grips thereon;

lamp attachment means carried by said upper arm, received by said slot, and movable therealong to adjustably position a lamp;

an elongated rectangular base plate having a slot extending longitudinally therealong, said slots being located relative to each other and said hinge means so that, when said lamp and said camera are properly adjusted relative to each other for one orientation of said camera, said camera may be pivotally reoriented without requiring readadjustment of said lamp relative to said camera to retain the centered position of said lamp;

camera attachment means received by said slot in said base plate for adjustably positioning a camera;

hinge means for pivotably connecting said base plate to said lower arm;

detent means for releasably securing said base plate in a horizontal position;

stop means for arresting said base plate in a vertical position; and

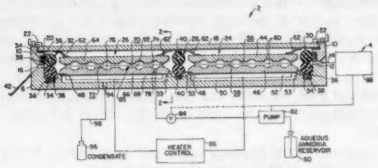
clamp means adjacent the top end of said handle portion for securing a cable release thereto.

4,255,037
HIGH SPEED, LOW TEMPERATURE AND PRESSURE DIAZO PROCESSING APPARATUS

John W. Meadows, Los Altos, and Robert J. Ritter, Mountain View, both of Calif., assignors to Quantor Corporation, Mountain View, Calif.

Continuation-in-part of Ser. No. 862,720, Dec. 27, 1977, Pat. No. 4,150,992. This application Apr. 17, 1978, Ser. No. 897,081
Int. Cl.[3] G03D *7/00*
U.S. Cl. 354—299 22 Claims

1. Apparatus for developing diazo film comprising means defining a developing chamber and including first and second, spaced apart, substantially parallel surfaces, a spacing between the surfaces exceeding a thickness of the film by no more than an amount required to readily move the film through the chamber; means defining an opening for introducing the film into the chamber and for removing it therefrom; means for moving the film through the opening and into and out of the chamber so that an emulsion side of the film passes immediately adjacent one of the surfaces; and means including an elongated shallow groove in the one surface for applying relatively low pressure aqueous ammonia vapor into a space

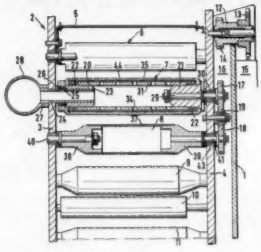


between the film emulsion and the one surface; whereby a rapid, low ammonia pressure vapor developing of the emulsion is effected.

4,255,038
HOLDER FOR PHOTOGRAPHIC PROCESSING MACHINES

Joachim Simon, Schillerstrasse 26, D-4006 Erkrath; Herman Held, Walstrasse 27, D-5439 Pottom, and Wilhelm Stoye, Eschenweg 31, D-4000 Düsseldorf 30, all of Fed. Rep. of Germany

Continuation of Ser. No. 831,433, Sep. 8, 1977, abandoned. This application Apr. 19, 1979, Ser. No. 31,398
Claims priority, application Fed. Rep. of Germany, Sep. 9, 1976, 2640527
Int. Cl.[3] G03D *5/06*
U.S. Cl. 354—318 5 Claims



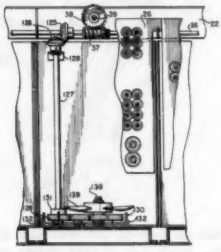
1. A holder for transporting photographic material through a processing bath of a photographic processing machine, comprising at least one pair of rollers rotatably arranged within a common frame with the surfaces of adjacent rollers pressed against each other, alternate ones of each pair of adjacent rollers having a rigid internal tube provided with radial openings along its length, the rigid internal tube carrying thereover and therealong a hoselike flexible cover, the flexible cover being permeable to the liquid in the processing bath, means for conducting liquid in the processing bath to the interior of the rigid roller having the flexible cover, said flexible cover being thereby subjected internally to hydraulic pressure, said flexible cover in its unloaded condition being spaced from the rigid internal tube which it surrounds due to said hydraulic pressure the cover having a smaller radial dimension in its loaded condition where it contacts the other, rigid, roller of each said pair of adjacent rollers, said contact defining a surface of contact, over an arc, along a portion of said flexible cover and along a portion of the other, rigid roller, whereby photographic material passing between said pair of rollers is contacted by the liquid in the processing bath over an arcuate surface of contact, and whereby the hydraulic pressure may be regulated to obtain the desired force along the arcuate surface of contact and the desired arc of contact.

4,255,039

PHOTOGRAPHIC FILM AND PAPER PROCESSING EQUIPMENT

Henry F. Hope, and Stephen F. Hope, both of 2421 Wyandotte Rd., Willow Grove, Pa. 19090

Filed Sep. 12, 1979, Ser. No. 74,784
Int. Cl.³ G03D *3/04*
U.S. Cl. 354—320 **6 Claims**



1. In photographic material processing equipment that includes at least one tank for containing a liquid for processing photographic material, a roller transport rack mounted in said tank, and power input means for driving said rack, the improvement which comprises

liquid agitating means in the lower part of said tank comprising a rotatable bladed impeller, and

power input means for driving said agitating means,

said power input means including

a power input shaft, and

an additional shaft connected to and driven by said power input shaft,

driving means interposed between said additional shaft and said impeller,

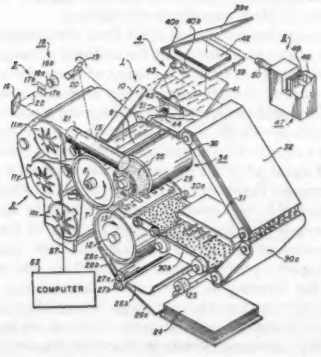
said driving means determining the speed of rotation of said impeller.

4,255,040

POSITIVE OVERLAY ELECTRONIC XEROGRAPHIC PRINTER

John W. Weigl, Webster; William M. Reilich, Ontario, and Louis D. Mailloux, Fairport, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Jul. 20, 1978, Ser. No. 926,346
Int. Cl.³ G03G *15/00*
U.S. Cl. 355—3 R **13 Claims**



1. A positive overlay electronic printer for producing integrated toner images on support members from electronic signal generated positive images and positive overlays comprising

a photoconductive member including an image forming surface supported for movement enabling the sequential production of toner images,

charging means for uniformly electrostatically charging the image surface of the photoconductor member,

overlay exposure means for creating a positive latent electrostatic image of a positive overlay by exposing the uniformly charged image surface to a positive light image corresponding to the positive overlay defining the background regions of the latent image as the discharged regions on the surfaces,

electronic exposure means responsive to electronic signals for creating a positive latent electrostatic image of an image represented by electronic signals by moving a discharging scanning spot relative to the uniformly charged image surface defining the background regions of the latent image as the discharge regions on the surface,

development means for developing latent images by depositing toner material on the surface to produce positive toner images with toner that adheres to the charged areas of the surface thereby corresponding to the latent image,

registration transfer means for transferring in registration sequentially developed toner images from the image surface to the same side of the same support member and

activating means for activating the electronic exposure and overlay exposure means to produce electronic and overlay latent images sequentially in either order for production of electronic and overlay toner images by the development means and for transfer of the sequentially produced electronic and overlay toner images to the same side of the same support member by the transfer means to produce said integrated toner image.

4,255,041

AUTOMATIC PRINTING APPARATUS

Noboru Koumura, Narashino; Toshiyuki Komatsu, Kawasaki; Katsumi Nakagawa, Tokyo; Nobuhiro Takekawa, Tokyo, and Motoharu Fujii, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 794,661, May 6, 1977, abandoned. This application Jan. 29, 1979, Ser. No. 7,628
Claims priority, application Japan, May 17, 1976, 51/56263
Int. Cl.³ G03G *15/00*
U.S. Cl. 355—3 R **17 Claims**

17. An automatic printing apparatus comprising:

means for accommodating an image forming element;

means for processing said image forming element to form a master, including means for exposing said element to an image of an original;

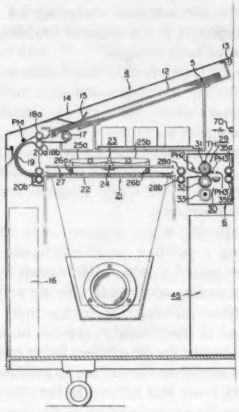
a rotary support member;

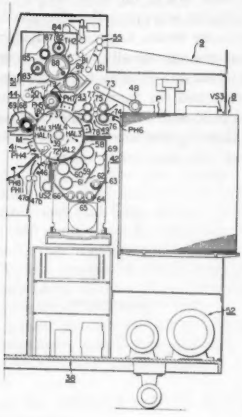
means for mounting said master on said rotary member;

means for detecting the presence or absence of said master on said rotary member prior to the formation of said master;

printing means for forming a toner image on said master and transferring said toner image onto a copy sheet;

means for separating said master from said rotary member; and





control means for controlling the operation of said processing, mounting, printing and separating means in sequence.

4,255,042

LIGHT PIPE FOR ACCURATE ERASURE OF PHOTOCONDUCTOR CHARGE

John D. Armitage, Jr., Longmont; John A. Barkley; Ross B. Hooker, III, both of Boulder, and James R. Walker, Longmont, all of Colo., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 26, 1979, Ser. No. 23,989

Int. Cl.[3] **G03G** *15/00*

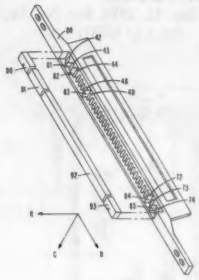
U.S. Cl. 355—3 R **4 Claims**

3. In an electrophotographic machine of the transfer type wherein erase mechanisms are included for shaping the charged image area of a moving photoreceptive surface to the dimensions of the image, the improvements comprising:

an array of LEDs for producing light rays to erase charge outside of said image area, said array located adjacent to said surface across the width thereof;

a light channel means located between said array and said surface to freely propagate said light rays in a first direction parallel to said surface from LED to LED while containing said light rays in a second direction normal to said first direction and

said light channel means comprising a plurality of sheets of



transparent material located between said array of LEDs and said surface, each one of said sheets separated from the other by an air gap to divide said array into groups of LEDs.

4,255,043

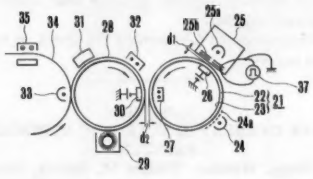
ELECTROSTATIC RECORDING METHOD AND APPARATUS BY DOUBLY CONTROLLING ION FLOW

Yasushi Hoshino, Yokosuka; Tooru Toida, Yokohama; Yukio Tokunaga; Kazuyoshi Tateishi, both of Yokosuka, and Rikuo Takano, Zushi, all of Japan, assignors to Nippon Telegraph and Telephone Public Corporation, Tokyo, Japan

Filed Jul. 12, 1979, Ser. No. 56,817

Int. Cl.[3] **G03G** *15/052, 13/052*

U.S. Cl. 355—3 SC **12 Claims**



1. An apparatus for electrostatic recording by doubly controlling ion flow comprising:

an insulator mesh supported movably and having one insulating surface and the other, opposite surface which is subjected to electroconductive treatment;

a first corona charger spaced apart from the one insulating surface of said insulator mesh, for uniformly charging said insulator mesh with electric charge of one polarity;

a second corona charger spaced apart a predetermined distance from said insulator mesh and having a control electrode with apertures, for providing on the one insulating surface a charge distribution corresponding to recording a control signal when the recording control signal is applied to the control electrode and ion current of the other polarity is applied to said insulator mesh through the apertures;

a third corona charger provided on the side of the other, electroconductive surface of said insulator mesh and spaced apart a predetermined distance from said insulator mesh, for forming an electrostatic latent image of the charge distribution whose charge is amplified as compared with that on said insulator mesh on an insulating recording substrate which is movable relative to said insulator mesh, by applying ion current of the one polarity to said substrate through the charge distribution on said insulator mesh; and

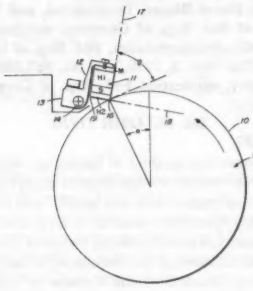
means for finalizing a record by using the thus formed electrostatic latent image.

4,255,044

CLEANING BLADE FOR ELECTROPHOTOGRAPHY

Raymond G. Cormier; Austin Davis, both of Nashua, N.H.; Jacques Guiguizian, Haverhill, Mass.; Leo O. Lutz, Hollis, and Henry T. Pauk, Nashua, both of N.H., assignors to Nashua Corporation, Nashua, N.H.

Filed Jul. 9, 1979, Ser. No. 56,129
Int. Cl.³ G03G *21/00*
U.S. Cl. 355—15 **11 Claims**



1. In an apparatus for removing residual toner from the photosensitive drum surface of a photocopying machine comprising:

(1) a rotating drum having a photosensitive surface;

(2) an elastic cleaning blade having a cleaning edge; and

(3) holding means for disposing said cleaning edge of said blade for contact with the photosensitive surface of said drum along the drum surface axial length as a trailing blade;

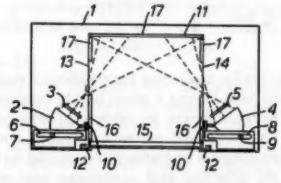
the improvement wherein said cleaning blade comprises at least one elastic material for providing said cleaning edge with a primary blade axis effective modulus of elasticity and a transverse blade axis effective modulus of elasticity, and said primary blade axis effective modulus of elasticity is less than said transverse blade axis effective modulus of elasticity.

4,255,045

REMOVABLE LIGHT BOX

Benjamin Eisenberg, Larchmont, N.Y., assignor to Ciba-Geigy AG, Basel, Switzerland

Filed Mar. 28, 1979, Ser. No. 24,820
Int. Cl.³ G03B *27/54*
U.S. Cl. 355—37 **6 Claims**



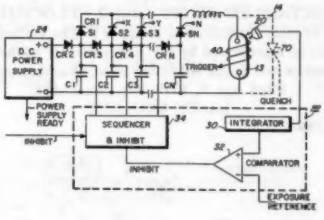
1. A lamphouse for use in the production of prints on variable contrast material or on conventional photographic material which comprises a tungsten filament lamp from which light passes through a first colour-selective filter passing light in one of two mutually exclusive wavebands and a tungsten filament lamp from which light passes through a second colour-selective filter passing light in the other of the two mutually exclusive wavebands, there being present in the lamphouse a removable light box of substantially rectangular shape, the light box having on each of the two sides adjacent to the two lamps a light entry port, the two lamps being so located in the lamphouse that they pass upwardly inclined beams of light into the light box, the portion of the light box above the light beam entry ports and the ceiling thereof being covered with light reflecting and light diffusing material, the remainder of the walls of the light box being of light-reflecting mirror material, the bottom of the box comprising a rectangular light diffusing screen, there being present in the lamphouse two guide members which are parallel to the plane of the screen in the light box and on or in which the two lamp members, each of which comprises one of the said lamps together with one colour-selective filter, guide mounting means and optionally lamphouse abutment means, are slideably mounted so that in operation when a light box is placed in the lamphouse both lamp members can be slid in or on their respective guides so that each lamp member abuts the said light guide box.

4,255,046

VARIABLE OUTPUT POWER SUPPLY FOR FLASH UNIT

Stephen C. Corona, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Sep. 19, 1979, Ser. No. 76,715
Int. Cl.³ G03B *27/72*; H05B *41/36*
U.S. Cl. 355—68 **8 Claims**



1. A flash illumination system comprising:

a flash lamp for illuminating an object at an object plane;

a variable output power supply connected to said flash lamp, said supply comprising a plurality of capacitors, each storing a discrete unit of electrical energy and a plurality of switches connected between an associated capacitor and the lamp;

sensing and integrating means for generating a signal that varies in proportion to the light reflected from said object;

a comparator for comparing said signal with a second reference signal representing a desired exposure level, said comparator generating an inhibit signal when said two signals are equal; and

a sequence and inhibit circuit connected to the output of said comparator, said circuit including logic means for monitoring the voltage output level of each of said plurality of capacitors and for causing sequential discharge of each capacitor by enabling the associated switch upon determining a signal level at the capacitor slightly higher than the self-extinguishing voltage level of the lamp and the absence of an inhibit signal.

4,255,047
PHOTOGRAPHIC PRINTING OF SUPERIMPOSED IMAGES

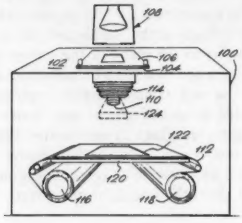
Sidney Chevin, Ilford, and Philip S. Fisher, London, both of England, assignors to Studio 21 (Sales) Ltd., Ilford, England

Filed Mar. 5, 1979, Ser. No. 17,474

Claims priority, application United Kingdom, Mar. 10, 1978, 9627/78

Int. Cl.³ G03B *27/02*

U.S. Cl. 355—79 **16 Claims**



1. A photographic printing machine for printing positives from negatives, the machine comprising a holder for a negative, a support for photographic paper, exposure means for controllably exposing the photographic paper to light, and apparatus for enabling superimposed images to be printed on photographic paper, said apparatus comprising a transparent member interposed between said photographic negative holder and said photographic paper support, said transparent member carrying at least one mask having at least one marker on a selected portion thereof, and photoelectric means for photoelectrically sensing said marker and means for indicating the position of said mask relative to said exposure means.

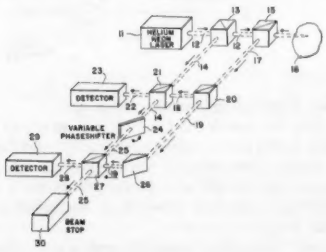
4,255,048
DIRECTION SENSITIVE LASER VELOCIMETER

John M. Franke, Norfolk, Va., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Apr. 6, 1979, Ser. No. 27,558

Int. Cl.³ G01P *3/36*

U.S. Cl. 356—28.5 **4 Claims**



1. An improvement in a laser velocimeter comprising:

a laser that produces a transmitted beam for illuminating a sample volume that is under investigation;

first and second photodetectors for producing electrical signals proportional to the light that strikes the detectors;

first optical means for collecting the backscattered light from said sample volume and splitting the collected light into two equal intensity beams with one beam directed to said first photodetector and with the other beam directed to said second photodetector;

second optical means for sampling said transmitted beam and for mixing the sample with said two equal intensity beams;

means for shifting by 90° the output signal from said first photodetector; and

means for multiplying the output signal from said first photodetector shifted by 90° with the output signal from said second photodetector whereby the signal at the output of the multiplying means is indicative of the direction of the movement of particles in said sample volume.

4,255,049
NON-DESTRUCTIVE TESTING OF STRUCTURAL ELEMENTS FOR FATIGUE BY MEASUREMENT OF SPECULAR REFLECTANCE

Karl-Frieder Sahm, Immenstaad; Enno van Rensen, Uhldingen-Muehlhofen; Horst Rieger, Immenstaad, and Franz Jaeger, Stetten, all of Fed. Rep. of Germany, assignors to Dornier System GmbH, Friedrichshafen, Fed. Rep. of Germany

Filed Nov. 2, 1978, Ser. No. 957,168

Claims priority, application Fed. Rep. of Germany, Nov. 8, 1977, 2749836

Int. Cl.³ G01B *11/16*

U.S. Cl. 356—32 **6 Claims**

1. A non-destructive method of testing an object for repetitive stresses which comprises the steps of applying to a stressed surface portion of said object one major face of at least one piece of a single crystal foil material in area contact, the other major face of said foil material being polished to high specular reflectance, and measuring the reduction of said specular reflectance after application of said stresses to said object, said foil material having an elastic limit lower than the elastic limit of the material of said surface portion, and lower than the stresses transmitted to said foil material from said surface portion.

4,255,050
APPARATUS FOR MEASURING THE POSITION OF WEFT THREADS IN A MOVING FABRIC WEB

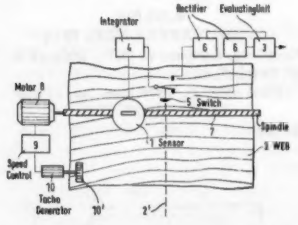
Hellmut Beckstein, Bad Abbach, and Guenter Schellenberger, Saal, both of Fed. Rep. of Germany, assignors to Mahlo GmbH & Co. KG, Saal, Fed. Rep. of Germany

Filed Oct. 25, 1979, Ser. No. 88,175

Claims priority, application Fed. Rep. of Germany, Nov. 23, 1978, 2850804

Int. Cl.³ D06M *3/12*; G01B *11/26*

U.S. Cl. 356—238 **8 Claims**

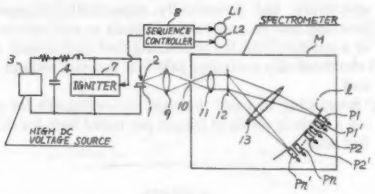


1. An apparatus for measuring the position of weft threads in a moving fabric web having a given width, comprising sensor head means, support means movably supporting said sensor head means for movement across said given width of said fabric web, drive means operatively connected to said sensor head means for effecting said movement, said sensor head means providing a first set of signals representing the weft thread deviation on one side of a longitudinal center line of said fabric web and a second set of signals representing the weft thread deviation on the other side of said center line, said apparatus further comprising signal evaluating means operatively connected to said sensor head means for comparing said first and second sets of signals to produce a control value.

4,255,051
APPARATUS FOR EMISSION SPECTROCHEMICAL ANALYSIS

Naoki Imamura; Isao Fukui, and Junichi Ono, all of Kyoto, Japan, assignors to Shimadzu Corporation, Kyoto, Japan

Filed Sep. 18, 1979, Ser. No. 76,751
Claims priority, application Japan, Sep. 29, 1978, 53-120679
Int. Cl.[3] G01J 3/30; G01N 21/67
U.S. Cl. 356—306 9 Claims



1. An apparatus for emission spectrochemical analysis of a sample comprising: means for generating a spark discharge to excite said sample to emit light; means for dispersing said light to produce a spectrum containing emission lines characteristic of the elements in said sample; first photoelectric means for receiving the light of said emission lines of the elements to be determined to produce a first corresponding electrical signal; second photoelectric means for receiving the light of those of said emission lines which are to be used as the internal standards to produce a second corresponding electrical signal; first integrating means for integrating said first electrical signal; second integrating means for integrating said second electrical signal; said first and second integrating means being operable in synchronism with the operation of said spark discharge generating means to perform integration of said first and second signals, respectively, at each said spark discharge; means for causing said integrating means to be cleared before production of the next spark discharge by said spark discharge generating means; means for providing the ratio of the output of said first integrating means caused by each said spark discharge to the output of said second integrating means caused by each said spark discharge; and means for accumulating said ratios resulting from a predetermined number of spark discharges.

4,255,052
METHOD OF GENERATING NITROGEN FOR FLAMELESS EMISSION SPECTROSCOPY

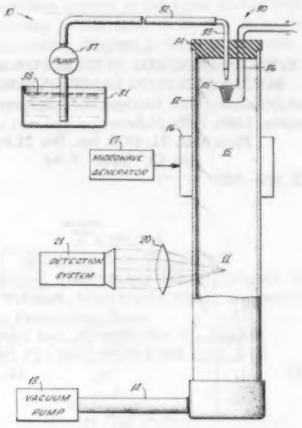
Robert J. Anderson, Villa Park, Calif., assignor to Beckman Instruments, Inc., Fullerton, Calif.

Continuation of Ser. No. 921,396, Jul. 3, 1978, abandoned. This application Sep. 25, 1979, Ser. No. 78,732
Int. Cl.[3] G01N 21/68
U.S. Cl. 356—316 10 Claims

1. In a system for analyzing the composition of a sample wherein the sample components are excited through collision with an active metastable gaseous species, the excited sample components emitting a characteristic wavelength of light which may be detected, said system including a chamber through which said gaseous species flows, a microwave cavity coupled to said chamber, and a microwave source coupled to said cavity, said source and said cavity exciting said gaseous species, a method for introducing said gaseous species into said chamber comprising:

dissolving in a suitable diluent a compound which is capable of releasing said gaseous species at high temperature and low pressure;

positioning a heatable element in said chamber, upstream of said mircrowave cavity; and

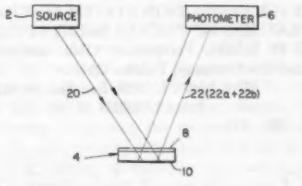


aspirating said diluent with said compound therein into said chamber, onto said heatable element, to generate said gaseous species within said chamber.

4,255,053
PHOTOMETER INCLUDING AUXILIARY INDICATOR MEANS

Dietrich W. Lübbers, and Norbert Opitz, both of Dortmund, Fed. Rep. of Germany, assignors to Max-Planck-Gesellschaft zur Förderung der Wissenschaften e.V., Göttingen, Fed. Rep. of Germany

Filed May 8, 1978, Ser. No. 903,411
Claims priority, application Fed. Rep. of Germany, May 6, 1977, 2720370
Int. Cl.[3] G01N 21/63
U.S. Cl. 356—318 8 Claims



1. An apparatus for investigating the concentration of a material, comprising an optometric device which includes wall means defining an indicator chamber, said wall means including a transparent wall portion and a wall portion through which the material under investigation can diffuse and the indicator chamber containing a first indicator substance which reacts to the presence of said material under investigation by modifying the spectral characteristics of light incident thereon in a manner which depends on the concentration of said material in the indicator chamber, and the apparatus also comprising a light source for generating beams of monochromatic light and directing them onto the indicator substance contained in the indicator chamber by way of said transparent wall portion, and photometric means for determining spectral characteristics of light emitted from the indicator chamber by way of said transparent wall portion, wherein the improvement comprises a second indicator substance contained in the indicator cham-

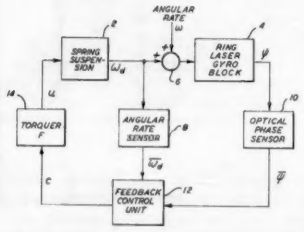
ber in addition to the first indicator substance and modifying the spectral characteristics of light incident thereon in a manner which is independent of the concentration of said material.

4,255,054

LOCK-IN CONTROL SYSTEM FOR SPRING SUSPENDED RING LASER GYROSCOPE

Bernard Friedland, West Orange, N.J., assignor to The Singer Company, Little Falls, N.J.

Filed Mar. 21, 1979, Ser. No. 22,549
Int. Cl.³ G01C *19/64*
U.S. Cl. 356—350 **5 Claims**



1. In combination with a spring-suspended ring laser gyroscope for providing a gyroscope readout which is proportional to angular input rate:

a torquer,

means for measuring the optical phase angle of the gyroscope and generating a signal proportional thereto,

means for measuring the dither rate of the gyroscope and generating a signal proportinal thereto, and

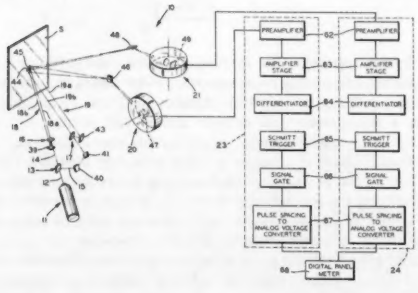
a feedback control unit for controlling the torquer to dither the gyroscope at a rate which is essentially equal to the lock-in characteristic of the gyroscope, the feedback control unit having as inputs the signals which are proportional to the gyro optical phase angle and to the dither rate.

4,255,055

SURFACE INSPECTION SYSTEM FOR DETECTING FLATNESS OF PLANAR SHEET MATERIALS

Richard D. Schave, Perrysburg, Ohio, assignor to Libbey-Owens-Ford Company, Toledo, Ohio

Filed May 11, 1979, Ser. No. 38,082
Int. Cl.³ G01B *11/30*
U.S. Cl. 356—371 **11 Claims**



1. In a method of determining the flatness of a planar sheet of transparent or reflective material whose surfaces may include positive and negative lenses in the area under observation, the improvement comprising the steps of:

(a) directing a collimated light beam toward a specified area on the surface of the sheet to be inspected;

(b) splitting said light beam into first and second coplanar pairs of beams of light;

(c) arranging said first and second coplanar pairs of light beams at right angles to each other;

(d) directing said first and second pairs of light beams against said sheet with a predetermined spacing between the light beams of each pair for defining the specified area;

(e) reflecting said first and second pairs of light beams from the specified area to first and second remote points, respectively, and periodically sequentially chopping said first and said second pairs of beams at said remote points at a constant rate for producing first and second signals;

(f) electronically analyzing said first and said second signals; and

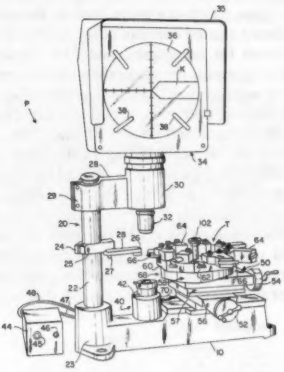
(g) integrating said first and said second signals for producing a logic in terms of fringes per radial inch for the specified area.

4,255,056

PRE-SETTER FOR POSITIONING TOOLING ON TURRETS

Anders A. Peterson, Elmira, N.Y., assignor to Hardinge Brothers, Inc., Elmira, N.Y.

Filed Mar. 30, 1979, Ser. No. 25,717
Int. Cl.³ G01B *11/00;* **B27G** *23/00*
U.S. Cl. 356—401 **23 Claims**



1. An optical presetter for precision alignment of a tool on a machine turret for subsequent positioning of said machine turret on a lathe or the like including:

(a) a base having a front portion and a rear portion;

(b) said rear portion simulating a lathe and including a movable carriage mounted thereon;

(c) said front portion consisting of an optical presetting system;

(d) a light source on said base for projecting a light beam;

(e) a viewer support mounted on said base and having an image viewer;

(f) said image viewer having means for receiving said light beam and projecting said beam onto said image viewer;

(g) said image viewer having a reference;

(h) means for positioning said carriage relative to said reference; and,

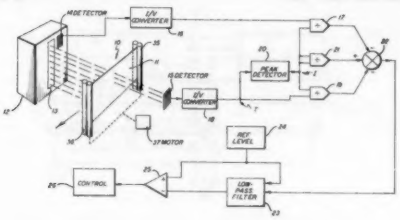
(i) whereby when said carriage is positioned relative to said reference and said turret is positioned on said carriage with said tool in said light beam, the tool image is projected on said viewer so that the tool can be precisely adjusted relative to said reference by shifting the tool relative to said turret thus shifting the tool image relative to said reference.

4,255,057

METHOD FOR DETERMINING QUALITY OF U.S. CURRENCY

Charles J. Williams, Carmel, N.Y., assignor to The Perkin-Elmer Corporation, Norwalk, Conn.

Filed Oct. 4, 1979, Ser. No. 81,752
Int. Cl.³ G01N *21/01, 21/89;* B65H *7/12*
U.S. Cl. 356—435 **17 Claims**



1. An apparatus for determining absorptivity of a bill, comprising:

a light source directing light onto a surface of the bill;

first means for sensing light reflected from said surface and providing an output voltage proportional to the reflection of light from the bill;

second means for sensing light transmitted through the bill and providing an output voltage proportional to the transmission of light through the bill;

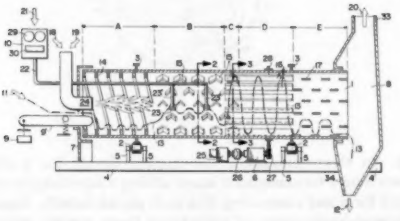
third means, connected to said first and second means, for providing an output voltage proportional to the absorptivity of the bill independent of variations in light source intensity.

4,255,058

APPARATUS FOR PREPARING BITUMINOUS MIXTURES, ESPECIALLY ROAD CONSTRUCTION MIXTURES

Gerhart Peleschka, Westerngrund-Oberwestern, and Dieter Sallmann, Gruendau-Rothenbergen, both of Fed. Rep. of Germany, assignors to WIBAU Industrie und Verwaltung GmbH, Gruendau, Fed. Rep. of Germany

Filed Jun. 20, 1979, Ser. No. 50,306
Int. Cl.³ B28C *5/46*
U.S. Cl. 366—25 **7 Claims**



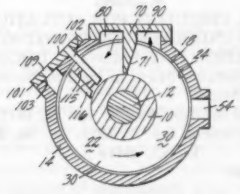
1. In an apparatus for preparing bituminous mixtures including a rotary drum having an inlet end and an outlet end and a plurality of zones in said rotary drum between said inlet end and said outlet end, said zones including a feed-in zone, a mixing zone, a lifting and dropping zone, and a discharge zone, the improvement comprising a uniformalizing zone operatively arranged between said mixing zone and said lifting and dropping zone, and wherein said feed-in zone comprises strip means (**14**) shaped to form a helix secured to the inner surface of said rotary drum, said strip means facing with a narrow edge substantially radially inwardly, said mixing zone comprising spraying jet means for supplying a bituminous binder component into said mixing zone and sectional angle iron members secured to the inner wall of said rotary drum so as to extend radially inwardly, said lifting and dropping zone comprising longitudinal members secured to the inner wall of said rotary drum and extending axially relative to said drum, said discharge zone comprising flat bars secured to the inner wall of said rotary drum and extending radially inwardly of said rotary drum, said uniformalizing zone comprising components of said mixing zone and components of said lifting and dropping zone arranged in an overlapping relationship.

4,255,059

PROCESSING ELEMENT

Peter Hold, Milford, Conn.; Zehev Tadmor, Teaneck, N.J., and Lefteris N. Valsamis, West Haven, Conn., assignors to USM Corporation, Farmington, Conn.

Filed Dec. 20, 1978, Ser. No. 971,513
Int. Cl.³ B01F *7/10;* B29B *1/06, 3/02*
U.S. Cl. 366—97 **16 Claims**



1. In processing apparatus which comprises a rotatable element carrying at least one annular processing channel; and a stationary element providing a coaxial surface cooperative with the processing channel to form with the channel an enclosed processing passage, said stationary element having an inlet to feed material to the processing passage and an outlet spaced apart from the inlet a major portion of the circumferential distance for discharging material from the passage and, a member associated with the stationary element and extending into the channel to provide a material collecting end wall, the improvement in which:

at least one non-rotatable member in the channel for at least partially obstructing movement of material urged toward the outlet by rotating walls of the channel but prov ding clearances at opposite sides of the member for passage of material between the member and the channel walls; and means flexibly connecting the member to the stationary element for self-centering movement between the channel side walls in response to hydrodynamic action caused by rotating the channel walls toward the outlet.

4,255,060

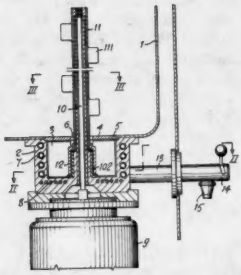
HOMOGENIZING DEVICE

Ezio Manfroni, Bologna, Italy, assignor to Carpigiani Bruto Macchine Automatiche S.p.A., Bologna, Italy

Filed Sep. 6, 1979, Ser. No. 72,924
Claims priority, application Italy, Sep. 22, 1978, 15257/78[U]
Int. Cl.³ B01F *15/06*
U.S. Cl. 366—137 **7 Claims**

1. A device for homogenization and thermal treatment of liquids for food-industry, and particularly of liquid mixtures for ice-cream, comprising a container, a centrifugal pump having both its inlet and outlet opening at the bottom of said

container so as to suck the liquid from said container and to pump it back into said container, and heating and cooling



means in said pump in heat-exchange relationship with the liquid flowing through said pump.

4,255,061

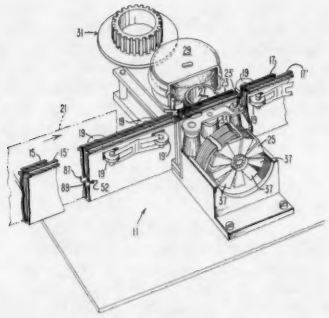
CONTROL CIRCUITRY FOR ACTUATION OF A RIBBONLESS ENDORSER FOR PRINTING VARIABLE INFORMATION ONTO MOVING DOCUMENTS

Jack Beery, Farmington, Mich., assignor to Burroughs Corporation, Detroit, Mich.

Continuation of Ser. No. 789,924, Apr. 22, 1977, abandoned. This application Feb. 28, 1979, Ser. No. 16,044

Int. Cl.³ B41J *3/12*

U.S. Cl. 400—124 **6 Claims**



1. Apparatus for printing characters onto a moving document traveling past a matrix pin printer in which each character is formed by a plurality of closely spaced columns of dot patterns and with spacing time occurring between the printing of characters, comprising:

first means for generating a plurality of successive signal commands;

second means cooperating with said first means, for printing a single column of dot patterns by a matrix pin printer responsive to generation of a said signal command;

third means for delaying printing of a single column of dot patterns by said second means, said third means responsive to a said generation of a said signal command which occurs prior to completion of an earlier said printing of a single column of dot patterns, said third means delaying until after said printing of a single column of dot patterns is completed; and

fourth means responsive to said spacing time between printing of entire characters for disabling said second means from responding to a said generated signal command.

4,255,062

MATRIX PRINT HEAD

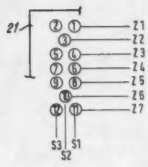
Wolfgang Hendrischk, Neu-Ulm, Fed. Rep. of Germany, assignor to Mannesmann Aktiengesellschaft, Dusseldorf, Fed. Rep. of Germany

Filed Mar. 30, 1979, Ser. No. 25,580

Claims priority, application Fed. Rep. of Germany, Apr. 17, 1978, 2817154

Int. Cl.³ B41J *3/12*

U.S. Cl. 400—124 **3 Claims**



1. A print head for a matrix printer comprising:

twelve print elements disposed so that their front end tips are arranged in three parallel vertical columns,

covering seven rows, there being two outer columns and one middle column accordingly, whereby a first, third, fourth, fifth and seventh row of each of the two outer columns holds a tip of a print element, being respectively one of said twelve elements, and the middle column having the remaining two tips, respectively, in the second and sixth column.

4,255,063

ELECTROMAGNETIC LINE SPACING DEVICE

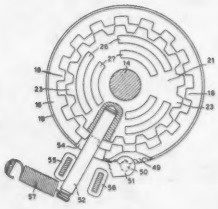
Adriano Zaltieri, Ivrea, and Giuseppe Coli, Banchette, both of Italy, assignors to Ing. C. Olivetti & C., S.p.A., Ivrea, Italy

Filed Jun. 28, 1978, Ser. No. 920,060

Claims priority, application Italy, Jul. 4, 1977, 68540 A/77

Int. Cl.³ B41J *19/76*

U.S. Cl. 400—568 **2 Claims**



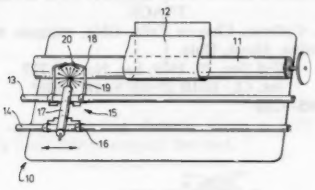
1. An electronmagnetic line-spacing device for a platen, comprising a ferromagnetic stator having a substantially cylindrical form and comprising first pole pieces radially disposed; a ferromagnetic rotor of cylindrical form, rotably mounted with respect to said stator, said ferromagnetic rotor comprising second pole pieces radially disposed in front of said first pole pieces, and third pole pieces frontally disposed; a ferromagnetic disc connected to said platen for rotating therewith and disposed in front of said third pole pieces; and a winding energizable for generating a magnetic flux crossing simultaneously said first, second and third pole pieces and said ferromagnetic disc, for producing a rotational movement of said ferromagnetic rotor with respect to said ferromagnetic stator, and the simultaneous coupling of said ferromagnetic rotor of said ferromagnetic disc connected to said platen for causing a rotation of said platen when said winding is energized.

4,255,064

PRINTING DEVICE WITH PAPER EDGE SENSING

Hugh-Peter G. Kelly, Leigh-on-Sea, England, assignor to A.E.S. Wordplex Limited, London, England

Filed Nov. 20, 1978, Ser. No. 962,022
Claims priority, application United Kingdom, Nov. 22, 1977, 48472/77; Apr. 25, 1978, 16244/78
Int. Cl.³ B41J *25/00, 25/30*
U.S. Cl. 400—708 **14 Claims**



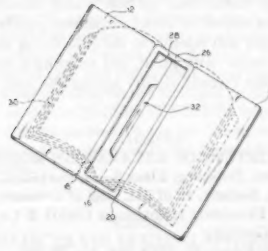
1. A printing device comprising a printing mechanism for printing on stationery and means for ensuring registration of the stationery and print applied thereto by the printing mechanism without the necessity of providing any indicating markings on said stationery, said means comprising a transducer arrangement arranged to scan stationery within the printing device and a control circuit for controlling operation of the printing mechanism and responsive to the output of the transducer arrangement for detecting and identifying the leading edge of an item of stationery being scanned and thereby providing a signal indicating the detected leading edge of the item, the control circuit being arranged so that before the start of printing on the item of stationery, the transducer arrangement scans for the leading edge of the item so as to produce said signal to enable text to be registered with the item and whereby printing of the text occurs with reference to the detected leading edge.

4,255,065

TELEPHONE DIRECTORY BINDERS

Dominic R. Errichiello, 389 Meadowlark Rd., Bloomingdale, Ill. 60108

Filed Aug. 6, 1979, Ser. No. 63,832
Int. Cl.³ B42D *3/10*
U.S. Cl. 402—75 **3 Claims**



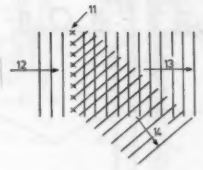
1. A binder for telephone directories used in public telephone facilities and the like, which comprises a front cover panel, rear cover panel, and a spine along whose opposite longitudinal edges the front and rear cover panels respectively are hingedly connected, and means for protectively securing on said spine and between said cover panels a telephone directory, said means being a thin metal member with oppositely extending wings adapted to lie between and against the bound edges of the pages of the directory and a thin edged tongue adapted to penetrate the bound edges of said pages and project through a slot in the spine, a hole through the spine-projecting part of said tongue, and means coacting with said hole and said spine for locking said tongue and said wings in book-securing position to prevent removal of said telephone directory from said binder.

4,255,066

ARRANGEMENT FOR CONCENTRATING SEA WAVES

Even Mehlum, Oslo, Norway, assignor to Sentralinstitutt for industriell forskning, Oslo, Norway

Filed Sep. 13, 1978, Ser. No. 942,497
Claims priority, application Norway, Sep. 13, 1977, 773154
Int. Cl.³ E02B *9/08*
U.S. Cl. 405—76 **12 Claims**



1. A system for concentrating water wave energy, said system comprising an off-shore grid-like means for transforming substantially rectilinear fronts of incident water waves into substantially arch-like water wave fronts with concentrated wave energy in a common central area spaced from said grid-like means, said grid-like means comprising a structure formed of a series of interacting water wave stopping and/or delaying elements arranged substantially transversely of a primary direction of propagation of said incident water waves, and said elements being relatively dimensioned such that elements and spacings therebetween in a central portion of said series of elements have larger dimensions in the longitudinal direction of said series than elements and spacings therebetween remote from said central portion.

4,255,067

DISPOSAL OF LIQUID WASTE AND RECOVERY OF METALS THEREFROM

John C. Wright, 1030 Santa Monica, Springfield, Ohio 45503, assignor to John C. Wright, Springfield, Ohio

Filed Nov. 2, 1978, Ser. No. 957,401
Int. Cl.³ C02F *1/00, 11/12*
U.S. Cl. 405—129 **10 Claims**

1. A method of recovering heavy metals from industrial liquid wastes containing such metals comprising the steps of:
preparing a soil bed to receive industrial liquid wastes containing heavy metals, the soil bed having a liquid-impermeable lining,
applying said wastes to said soil bed,
evaporating the water contained in the soil bed, and
mining the soil bed to recover the heavy metals contained therein.

4,255,068

METHOD AND A DEVICE FOR UNDERSEA DRILLING

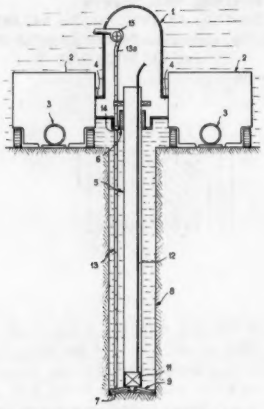
Alfred Valantin, Clermont, France, assignor to Techniques Industrielles et Minieres, Paris, France, a part interest

Filed Jun. 26, 1979, Ser. No. 52,237
Claims priority, application France, Jul. 4, 1978, 78 19897
Int. Cl.³ E21B *7/12*
U.S. Cl. 405—195 **11 Claims**

1. A method of underwater drilling for exploring and exploiting ocean bottom formations comprising the erection of a drilling station directly above the selected site and the drilling operation which is carried out from said station, wherein said method essentially comprises the operations which consist:

(a) in boring a sea-floor shaft in order to form a drilling and exploitation station having sufficient dimensions to contain personnel and drilling equipment, this operation being performed by means of a shaft-boring module which rests on the bottom,

(b) in lining the walls of the shaft with a casing which is cemented against said shaft walls and is surmounted by a water-tight self-contained subsea chamber,



(c) in extracting sea-water from the shaft,

(d) in maintaining atmospheric pressure within the shaft and within the subsea chamber,

(e) in lowering personnel and drilling equipment into the shaft,

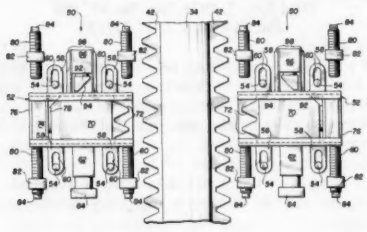
(f) in carrying out drilling operations from the bottom of the shaft.

4,255,069

JACK-UP PLATFORM LOCKING APPARATUS

Ralph D. Yielding, Houston, Tex., assignor to The Offshore Company, Houston, Tex.

Filed Aug. 1, 1979, Ser. No. 62,659
Int. Cl.[3] E02B *17/08;* B66F *1/00*
U.S. Cl. 405—196 **11 Claims**



1. A jack-up platform locking apparatus for at least partially securing a vertically adjustable leg of an offshore platform with respect to a deck of the platform, said locking apparatus comprising:

frame means operable to be securely connected to the deck of the offshore platform;

lock means having at least one tooth for engaging a compatibly configured surface on the vertically adjustable leg of the offshore platform;

means for vertically adjusting said lock means with respect to said deck and said leg;

means for horizontally actuating or deactivating said lock means with respect to said leg for engaging and disengaging said at least one tooth with respect to the compatibly configured surface on said vertically adjustable leg;

means for vertically securing said lock means with respect to said deck and said leg; and

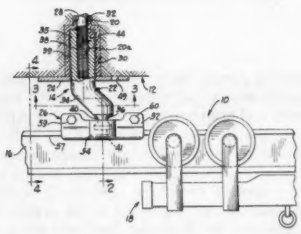
means for horizontally securing said lock means with respect to said deck and said leg.

4,255,070

SINGLE-BOLT ROOF SUSPENSION FOR OVERHEAD TRACK

Walter L. Calhoun, Chagrin Falls, Ohio, assignor to McNeil Corporation, Akron, Ohio

Filed Dec. 20, 1979, Ser. No. 105,727
Int. Cl.[3] E01B *25/24;* E21D *20/02*
U.S. Cl. 405—260 **6 Claims**



2. A roof connection for an overhead rail, capable of horizontal and vertical adjustment comprising a bolt adapted to be secured vertically and having a lower threaded end, a suspension unit of a crank arm construction, one end having external threads and an internally threaded bore in which the bolt is received, and the other end offset from said one end and configured to attach a rail fitting, and a plate with a threaded opening secured to the external threads of the suspension unit.

5. In a method of suspending an overhead support to a mine roof, the steps comprising: drilling a single vertical counterbored hole at the intended location of each of a number of spaced suspension assemblies for the support, securing an end of a bolt in the hole so a threaded portion of the bolt extends within the counterbore, securing a crank-shaped suspension unit having an internally and externally threaded collar at one end and an offset suspension portion at the other end to the bolt by threading the collar onto the bolt within the counterbore, adjusting the portion of the offset suspension portion by rotating the suspension unit relative to the bolt, filling the counterbore about the collar with grout, and securing a roof plate to the external collar threads, tightly against the roof.

4,255,071

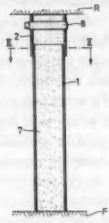
SUPPORTING OF EXCAVATION ROOFS

Manfred Koppers, Duisburg; Klaus Spies, Dortmund, and Karl-heinz Bohnes, Bochum, all of Fed. Rep. of Germany, assignors to Bochumer Eisenhütte Heintzmann GmbH & Co., Bochum, Fed. Rep. of Germany

Filed Aug. 27, 1979, Ser. No. 70,307
Int. Cl.[3] E21D *23/04*
U.S. Cl. 405—290 **17 Claims**

1. A method of supporting an overburden, particularly a roof of an underground excavation such as a mine, comprising the steps of providing a hollow tubular prop casing having at least one section of self-supporting sheet material and which is circumferentially incomplete and has a longitudinally extending slit; overlapping marginal portions of said sheet material bounding said slit, to an extent requisite for obtaining a desired diameter of said section; arresting the overlapped portions in their overlapped condition; erecting the prop casing so that it

bears upon the roof to be supported; and filling the prop casing with a hardenable substance in flowable condition so that said



substance, upon hardening thereof, forms a solid column which is by itself able to support the roof.

4,255,072

FLOW LEADING FLOOR FOR WHIRL CHUTES

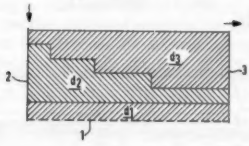
Günther Gappa, Gelsenkirchen; Harald Jüntgen, Essen-Heisingen; Jürgen Klein, Essen-Überruhr, and Peter Schulz, Essen-Steele, all of Fed. Rep. of Germany, assignors to Bergwerksverband GmbH, Essen, Fed. Rep. of Germany

Filed Jul. 31, 1978, Ser. No. 929,320

Claims priority, application Fed. Rep. of Germany, Jan. 8, 1978, 2734608

Int. Cl.³ B65G *53/20*

U.S. Cl. 406—89 **9 Claims**



1. In a fluidized-bed channel for treating a flow of solid particles introduced at an inlet end and discharged at an outlet end of the channel, a combination comprising wall means defining the channel, including a bottom wall adapted for introducing into the channel a fluidizing gas to impart to said particles a fluidizing motion in vertical direction and to advance said particles in longitudinal direction from said inlet end to said outlet end; and filling-body layer means, including at least one layer of filling bodies arranged on said bottom wall and having successive portions of different heights and therefore of different gas permeability in the direction of advance of said particles, in accordance with the desired fluidizing speed of said particles.

4,255,073

AUTOMATIC PLATE FEEDING APPARATUS FOR EMBOSSING MACHINES

Helmut A. M. Schöttle, Berlin, Fed. Rep. of Germany, assignor to Pitney Bowes Deutschland GmbH, Heppenheim, Fed. Rep. of Germany

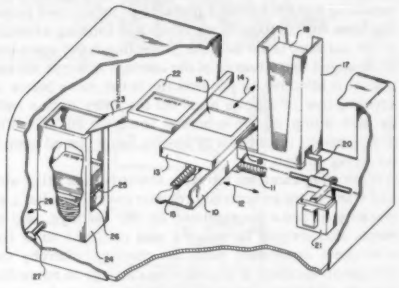
Filed Mar. 19, 1979, Ser. No. 22,013

Claims priority, application Fed. Rep. of Germany, Mar. 21, 1978, 7808617[U]

Int. Cl.³ B41J *3/38*; B65H *5/16*

U.S. Cl. 414—32 **1 Claim**

1. A plate feeding apparatus for feeding plates to be embossed by an embossing machine, comprising: a plate carriage mounted for movement along a first path, means for moving said plate carriage along said first path, a plate holder movably mounted on said plate carriage, means for moving said plate holder along a second path which is substantially perpendicular to said first path, a plate hopper having a slot at the bottom thereof located at a first end of the said first path, said plate holder having a trough therein with an inlet slot adjacent to and in registration with said slot at said bottom of said plate



hopper and an outlet slot opposed to said inlet slot, a plate stacker located on the second end of said first path, said plate holder being in communication with said plate stacker through an intermediate magazine having a slide connected thereto that is adjacent to said plate stacker, a driving pawl located at said first end of said path and means for inserting said driving pawl within the bottom of said hopper, and an electromagnetic means for driving said pawl into and out of said first path.

4,255,074

PALLETIZING MACHINE

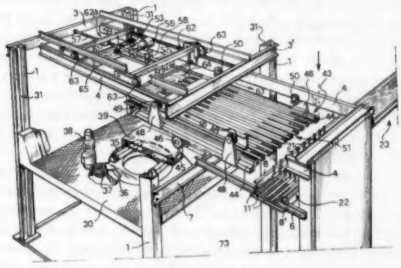
Gianattilio Meratti, Torre de' Roveri, and Eugenio Madaschi, Albano S. Alesseandro, both of Italy, assignors to Meccanotecnica S.p.A., Bergamo, Italy

Filed Jul. 16, 1979, Ser. No. 57,857

Claims priority, application Italy, Jul. 25, 1978, 68772 A/78

Int. Cl.³ B65G *57/24*

U.S. Cl. 414—62 **10 Claims**



1. A palletising machine for stacking rows of articles in layers on a pallet, the machine comprising

a framework,

a pallet support mounted on the framework for vertical movement,

an entry station with a roller bed extending in a longitudinal direction of the entry station and serving to accumulate a row of articles to be stacked on a pallet, said roller bed being formed by a plurality of spaced rollers whose axes extend perpendicularly to said longitudinal direction of the entry station,

a lifting device arranged to lift off from the rollers of the entry station a row of articles positioned thereat,

an intermediate support on which a plurality of rows of

articles from said entry station are accumulated above a pallet positioned on said pallet support prior to their transfer as a layer onto the pallet, said intermediate support being formed by a carriage horizontally movable along the framework from above the pallet towards the entry station, said carriage including a roller bed formed by rollers whose axes of rotation extend parallel to said longitudinal direction of the entry station, and the carriage being provided on its side facing the entry station with a receiving section having a plurality of roller rows projecting from the carriage like a comb and forming extensions of the carriage roller bed, the projecting roller rows being so arranged that advance of the carriage towards the entry station is effective to position the roller rows below and across a row of articles lifted off the entry station rollers by said lifting device whereby lowering of said lifting device results in said row of articles being placed upon the receiving section,

two registering elements movable towards each other along said framework to centrally register over the pallet a said plurality of rows accumulated on the carriage, said elements also serving to restrain said centered rows from subsequent movement with the carriage whereby such movement is effective to cause the carriage to move from beneath said rows and enable them to descend onto the pallet, the said element nearest the entry station being retractable to a position in which it allows unimpeded transfer of rows onto the carriage, and

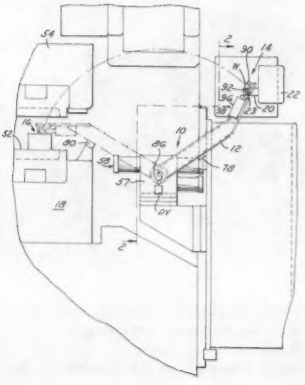
a control unit arranged to coordinate the operation of the machine such that a plurality of rows of articles are successively transferred from the entry station to the intermediate support carriage from where they are transferred together onto the pallet as a layer of articles, the pallet being thereafter moved down by lowering of the pallet support in order to receive a next layer upon that just placed.

4,255,075

LOADER

Albert B. Babbitt, Pontiac, Mich., assignor to Premier Forging Press Automation, Inc., Madison Heights, Mich.

Filed Nov. 1, 1978, Ser. No. 956,685
Int. Cl.³ B65G 65/02
U.S. Cl. 414—222 **3 Claims**



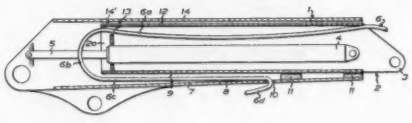
1. Loading mechanism for a forging press or the like having a work receiving station, said mechanism comprising, a work pickup station having means providing a work-supporting surface, a transfer member movable from said receiving station across said work-supporting surface to a pickup position at said pickup station and from said pickup position at said pickup station across said work-supporting surface to said receiving station, a work clamp on said transfer member, means for advancing said transfer member from said pickup position at said pickup station to said receiving station, means for closing said clamp, means for opening said clamp, conveyor means for advancing a workpiece to said work-supporting surface, a gate operative when open to admit a workpiece to said work-supporting surface, means operative to open said gate in response to the return of said transfer member to said pickup position at said pickup station, means operative to close said gate in response to the presence of a workpiece on said work-supporting surface, means operative when said transfer member is in said pickup position at said pickup station to operate said clamp closing means and said transfer member advancing means in sequence to clamp the work and advance the same to said receiving station, and means operative when said transfer member is at said receiving station to operate said clamp opening means and said transfer member returning means in sequence to release the work and return said transfer member to said pickup station.

4,255,076

LOADING APPARATUS WITH EXTENSION BOOM (TELESCOPIC BOOM) AND WITH HYDRAULIC LINES CARRIED BY THE BOOM

Sven Svenning, Partille, Sweden, assignor to Jonsereds AB, Sweden

Filed Jun. 22, 1977, Ser. No. 808,925
Claims priority, application Sweden, Jun. 23, 1976, 7607230
Int. Cl.² B66F 9/22
U.S. Cl. 414—729 **7 Claims**

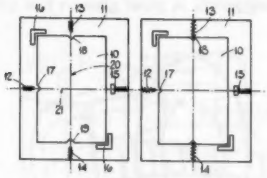


1. A telescopically extensible boom loading apparatus comprising an outer hollow boom section, an inner boom section in telescopic relationship in said boom, and at least one flexible hydraulic hose extending with a flexible section from said outer hollow boom section to said inner telescopic boom section, said flexible hose being of sufficient length to permit maximum extension of the inner telescopic boom section in relation to the outer boom section and forming a loop having a pair of opposite legs and a substantially C-shaped bight extending from and connecting each of said legs to the other, and further extending in a longitudinal direction in said telescopically extensible boom, one of said loop legs being shortened and the other lengthened, and vice versa, and the C-bight being moved longitudinally in the boom when the boom sections are extended and retracted, wherein said inner boom section comprises a longitudinally web and at least one protruding flange forming a guide and spacer means for guiding the inner boom section in the outer hollow boom section with the web of the inner boom section in spaced relation to at least one inner side of the outer boom section, the said inner side of the hollow outer boom section and said web and flange of the inner boom section forming, when the inner boom section is retracted in the outer boom section, an open ended channel; and wherein said loop with its C-bight are housed in said channel between the said inner side of said outer boom section and the said web of the inner boom section with one of the legs of said loop of the flexible hose being seated on the protruding flange.

4,255,077
METHOD OF ALIGNING

Raymond B. Smith, West Midlands, England, assignor to Lucas Industries Limited, Birmingham, England

Filed Apr. 3, 1978, Ser. No. 892,851
Claims priority, application United Kingdom, Apr. 12, 1977, 15098/77
Int. Cl.[3] B65H 9/06
U.S. Cl. 414—786 20 Claims

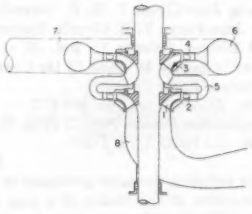


1. A method of locating a board at a precise location on a support, comprising the steps of providing a respective formation on, and intermediate the ends of, each of two adjacent side edges of the board, said formations being directed along respective axes which intersect generally centrally of said board, each said formation having a pair of mutually tapered side edges disposed in the plane of said board; positioning said board on said support; and engaging a pair of locators on said support with the respective formations on the board so that said locators engage the mutually tapered side edges of the respective formations, each locator being urged by a force acting along an axis on which a respective abutment of the support lies, the axes along which said forces act being mutually intersecting so that each locator serves to urge the board against the respective abutment whereby the axes along which said formations are directed are accurately aligned with the axes along which the locators act.

4,255,078
METHOD OF CONTROLLING OPERATION OF MULTISTAGE HYDRAULIC MACHINES

Sachio Tsunoda, and Masaharu Nonaka, both of Yokohama, Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Japan

Filed Feb. 5, 1979, Ser. No. 9,928
Claims priority, application Japan, Feb. 14, 1978, 53-15035
Int. Cl.[3] F01D 17/00, 21/00
U.S. Cl. 415—1 5 Claims

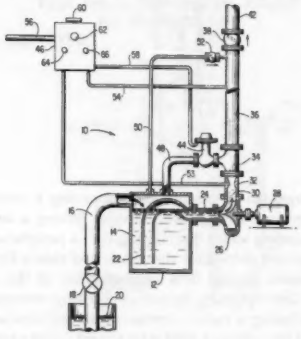


1. A method of controlling higher and lower pressure stage guide vanes of a multistage hydraulic machine including a plurality of stages interconnected by return passages, comprising the steps of closing the guide vanes, under an abnormal condition, such that the degree of opening of the guide vanes of the higher pressure stage is maintained always equal to or smaller than a degree of opening of the guide vanes of the lower pressure stage and maintaining the guide vanes of said lower pressure stage open a predetermined small degree when the guide vanes of said higher pressure stage are completely closed thereby to independently control variations in fluid pressure and rotating speed of said machine.

4,255,079
SELF-PRIMING SYSTEM FOR PUMPS

Tad Piegza, Bayonne, N.J., assignor to Penco Division of Hudson Engineering Company, Hoboken, N.J.

Filed Aug. 6, 1979, Ser. No. 63,696
Int. Cl.[3] F01B 25/00
U.S. Cl. 415—11 3 Claims



1. In a self-priming pump system comprising a pump having an outlet and an inlet, a suction well defining a cavity at least partially below said inlet, suction line means for introducing liquid to be pumped into said cavity to a level including the top of the inlet, conduit means positioned in said cavity with one end terminating below said inlet adjacent the bottom of said cavity and with its other end connected to said inlet, reservoir means having an upstream end and a downstream end, said upstream end of said reservoir means connected to said outlet of said pump, a one-way check valve located at said downstream end of said reservoir means enabling downstream fluid movement only, drain means interconnecting said cavity and said reservoir means, repriming valve means positioned upstream from said check valve and mutually cooperating with said reservoir means and said drain means to return liquid in said reservoir means to said cavity via said drain means in response to a reduction in liquid flow from said pump, an air relief pipe connected from the top of said cavity to said reservoir means adjacent the upstream side of said check valve, and a second one-way check valve provided in said air relief pipe enabling fluid movement only in a direction towards said reservoir means, the improvement wherein the drain means includes a tee-connection positioned in a lower portion of the reservoir means and pipe means for interconnecting said tee-connection and the cavity, the repriming valve means being positioned in said pipe means; wherein the reservoir means includes venturi means for defining a flow restriction therein; and wherein the system includes adjustable control means for selectively actuating the repriming valve means in response to variations in fluid movement through the reservoir means, said control means including:

first means for sensing and generating a first signal representative of the pressure within said flow restriction;

second means for sensing and generating a second signal representative of the pressure within the reservoir means at a position spaced from said flow restriction; and

controller means for comparing said first and said second signals and for opening the repriming valve when the difference between the signals falls to a predetermined point, the predetermined point being adjustable so that the system responds to the characteristics liquid being pumped.

4,255,080

FANS OR THE LIKE

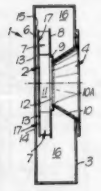
Robert R. Wilson, Kilmacolm, and Roy D. Falconer, Bridge of Weir, both of Scotland, assignors to James Howden & Company Limited, Glasgow, Scotland

Filed Mar. 23, 1979, Ser. No. 23,349

Claims priority, application United Kingdom, Mar. 28, 1978, 11928/78

Int. Cl.[3] F04D *1/00*

U.S. Cl. 415—53 R 9 Claims



1. A centrifugal fan or compressor comprising a centrifugal impeller housed in a casing, said impeller having a series of outwardly extending vanes discharging into a peripheral zone and at least one end shroud for the vanes; and means for stabilising the pressure against flow characteristic of the fan or compressor at low operating speeds comprising recirculatory duct means including a radial clearance passage between said end shroud and the casing, a fluid inlet to said radial passage to enable gas to flow from said peripheral zone to the radial passage, notches extending from the free periphery of the end shroud over a substantial radial depth in the shroud for the flow of gas from said radial passage to the impeller vanes.

4,255,081

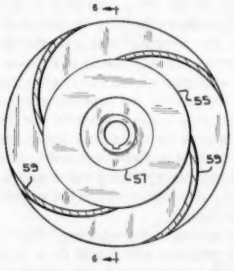
CENTRIFUGAL PUMP

Robert A. Oklejas, 3311 Lakeview Dr., Baycrest Beach, Monroe, Mich. 48161, and Eli Oklejas, 517 W. Madison St., Apt. 5, Lansing, Mich. 48906

Filed Jun. 7, 1979, Ser. No. 46,457

Int. Cl.[3] F01D *1/36*

U.S. Cl. 415—90 6 Claims



1. A rotor for a centrifugal pump comprising:

a plurality of spaced apart, substantially circular, rotatable and substantially parallel disks, the disks containing a center aperture; and

a plurality of arcuate vanes connected to the outer peripheral edge of the disks, the vanes extending from the outer peripheral edge of the disks in a direction away from the center aperture in the disks.

4,255,082

ASPIRATING SYSTEM FOR THE COMPRESSOR OF A GAS TURBINE

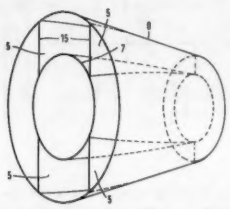
Konrad Goebel, Erlangen, Fed. Rep. of Germany, assignor to Kraftwerk Union Aktiengesellschaft, Mülheim, Fed. Rep. of Germany

Filed Aug. 3, 1978, Ser. No. 930,562

Claims priority, application Fed. Rep. of Germany, Aug. 10, 1977, 2736074

Int. Cl.[3] F04D *29/40*

U.S. Cl. 415—182 4 Claims



1. Aspirating system for a compressor of a gas turbine disposed on the same shaft next to a power-producing machine which comprises

(a) two suction canals separated from each other extending laterally next to the power-producing machine,

(b) an axial intake opening of hollow-cylindrical cross section in the compressor for the intake of air,

(c) a transition part having an inner shell of a truncated cone and an outer shell of the truncated cone leading toward the shaft and connected with the axial intake opening of hollow-cylindrical cross section of the compressor for flow of air from the two suction canals to the axial intake of the compressor,

(d) two baffles in a vertical plane approaching each other in the direction of flow of air, disposed between the inner cone shell and outer cone shell of the transition part, with the baffles touching each other in front of the intake opening of the compressor and terminating there, and

(e) the cross section of each said suction canal adapted on the side facing the transition part, to the entrance cross section of the transition part defined by the inner and outer cone shells and the vertical baffle.

4,255,083

METHOD AND DEVICE FOR REDUCING THE NOISE OF TURBO-MACHINES

Pierre A. Andre, Paris; Jean-Claude P. H. P. Thevenin, Saint-Maur-Des-Fosses; Jean-Pierre Y. B. Girault, Dammarie Les Lys, and Gerhard Richter, Boissise Le Roi, all of France, assignors to Societe Nationale D'Etude Et De Construction De Moteurs D'Aviation, Paris, France

Filed Dec. 27, 1977, Ser. No. 849,472

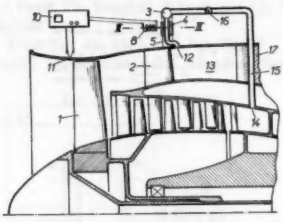
Claims priority, application France, Nov. 7, 1976, 76 30465

Int. Cl.[3] F01D *5/10, 5/26*

U.S. Cl. 415—119 5 Claims

1. An apparatus for reducing the noise produced in a turbomachine by the interaction of the blades of a ring of rotor blades and the vanes of a ring of stator vanes by creating a counter-noise of opposed phase, said apparatus comprising a plurality of injection orifices located on stationary parts of the machine which are equal in number to the number of vanes of said ring of stator vanes, means for injecting a fluid through said orifices into the flow passage in which said blades and vanes are located, means for modulating the flow through the orifices at the frequency of the noise to be reduced and with a phase difference which increases in an incremental manner from one orifice to the next, and means for simultaneously regulating the phase of the modulated flows injected through

the said orifices so that the acoustic waves created by the said flows are substantially in opposition, with respect to phase, to those of the noise to be reduced; said regulating means comprising a cylindrical screen coaxial with the rotor shaft and integral with the tips of the blades of the rotor ring; a circumferential surface encircled by said screen; a plurality of injection pipes leading to said injection orifices and having fixed mouths distributed on said surface; a toroidal manifold surrounding said screen; a peripheral opening in said screen of a width which varies cyclically as it extends around the screen, one face of the said opening being in direct communication



with the toroidal manifold and the other face of the said opening moving before the mouth of each of the injection pipes; a phase regulator ring with variable angular setting coaxial with the cylindrical screen and in slidably fitting engagement between the cylindrical screen and the injection pipes; a plurality of identical holes regularly spaced around said phase regulator ring, each communicating with the mouth of an injection pipe; and an injection chamber located at the mouth of each injection pipe to ensure constant communication between the injection pipe and the corresponding hole in the phase regulator ring, regardless of changes in the ring setting.

4,255,084

DEVICE FOR DAMPING THE VIBRATIONS OF A ROTARY-WING AIRCRAFT ROTOR

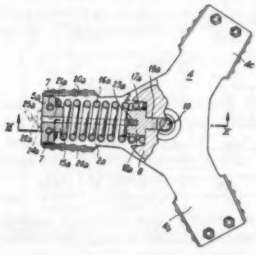
Rene L. Mouille, Aix-en-Provence; Gerard C. L. Genoux, Gardanne; Marc A. Declercq, Pelissanne; Jean-Luc M. Leman, Aix-en-Provence, and Robert J. Suzzi, Marseille, all of France, assignors to Societe Nationale Industrielle et Aerospatiale, France

Filed Feb. 5, 1979, Ser. No. 9,614

Claims priority, application France, Feb. 10, 1978, 78 03809

Int. Cl.³ B64C *27/32*; F16C *15/00*

U.S. Cl. 416—145 **14 Claims**



1. A resonator device for damping the vibrations of a rotary-wing aircraft rotor having a hub, the device comprising:

a flapping weight disposed at the top of the rotor hub and concentrated near the rotor axis;

means for returning said weight resiliently towards an inoperative position centred on such axis, said means comprising at least three resiliently deformable elements, which are each radially biassed in directions distributed regularly around the rotor axis, the inner ends of said elements directly bearing on said flapping weight; and

rigid structure elements, rigidly secured to the rotor hub, the outer ends of said resiliently deformable elements bearing on said structure elements so as to apply statically balanced centripetal thrusts to said flapping weight.

4,255,085

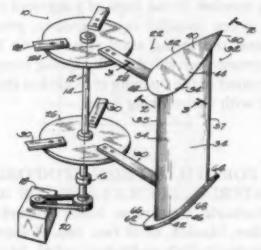
FLOW AUGMENTERS FOR VERTICAL-AXIS WINDMILLS AND TURBINES

Frederick C. Evans, 30 James St., Pittenweem, Fife, Scotland

Filed Jun. 2, 1980, Ser. No. 155,619

Int. Cl.³ F03D *3/06*

U.S. Cl. 416—197 A **11 Claims**



1. A windmill comprising a vertical shaft mounted for rotation about its longitudinal axis, a number of blades spaced circumferentially around said longitudinal axis, each of said blades being disposed generally parallel to the axis of rotation of the vertical shaft, supporting arms extending radially outwardly from the vertical shaft for supporting said blades, and means for increasing the rate of mass flow through the windmill including a member connected to at least one of said blades, said member defining a surface, said surface having a leading edge with respect to the direction of movement of the blade and a trailing edge rearward of said leading edge, said leading edge being lower with respect to said vertical axis than said trailing edge, an inside lateral edge and an outer lateral edge spaced radially outwardly from said inside lateral edge, said inside lateral edge being higher with respect to said vertical axis than said outside lateral edge.

4,255,086

LOCKING DEVICE FOR BLADE MOUNTING

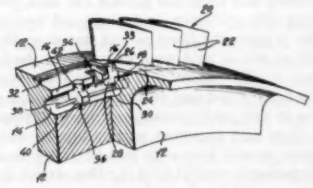
Ivor J. Roberts, St. Lambert, Canada, assignor to Pratt & Whitney Aircraft of Canada Limited, Longueuil, Canada

Filed Jul. 18, 1979, Ser. No. 58,426

Claims priority, application Canada, Jun. 27, 1979, 330729

Int. Cl.³ F03B *3/16, 3/12*

U.S. Cl. 416—218 **6 Claims**



1. A rotor assembly comprising a spool, a circumferential groove defined in the spool and including a pair of inwardly extending flanges defining a throat narrower than the groove and providing a pair of continuous shoulder receiving seats

co-extensive with the groove, a radially defined stacking hole communicating with said groove, a plurality of rotor blade members each having a root portion including a pair of shoulders adapted to mate with the shoulder receiving seats, the stacking hole being such as to allow the root of each blade to pass therethrough, said root portion only partially filling said groove in axial cross-section, and each root portion including a spring receiving seat having an axis extending in the circumferential direction when mounted in the groove, each blade member including a platform member spaced radially from the root and adapted to be seated on the exterior of the flanges, at least two of the blade platforms each defining a complemental opening such that when all of the blade members are assembled on the spool, the two blades having platforms defining complemental openings are arranged to provide an opening aligned radially with the stacking hole, and a locking member including a spring member in the form of a segment of a circle being adapted to, when installed in the groove, press radially outwardly against the spring seats provided on the roots and a locking protrusion provided on the spring member adapted to fit and be located in the opening provided in the two platforms and aligned with the stacking hole.

4,255,087

MEMBER FORMED OF FIBER-REINFORCED PLASTIC MATERIAL, SUCH AS A ROTOR BLADE

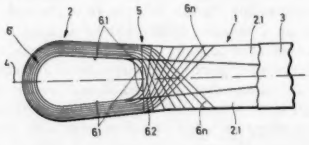
Peter M. Wackerle, Ottobrunn; Klaus Brunsch, Weidach, and Josef Gröber, Munich, all of Fed. Rep. of Germany, assignors to Messerschmitt-Bolkow-Blohm GmbH, Munich, Fed. Rep. of Germany

Filed Jun. 5, 1979, Ser. No. 45,845

Claims priority, application Fed. Rep. of Germany, Jun. 19, 1978, 2826656

Int. Cl.³ B64C *27/46*

U.S. Cl. 416—230 **4 Claims**



1. A member formed of fiber-reinforced plastic material, such as a rotor blade, and arranged for the absorption of at least one of longitudinal forces and bending forces, comprising a longitudinally extending member having a longitudinal axis with a loop at one end of said member, an elongated section extending from said loop in the direction of the longitudinal axis, said section including a neck portion and a transition portion interconnecting said loop and said neck portion, said longitudinally extending member comprising an elongated bundle of fiber strands forming said loop intermediate the ends of said bundle and having two limb portions thereof each extending from said loop alongside the other, said limb portions forming said transition portion and neck portion, a fiber reinforced skin enclosing said elongated section from said transition portion, the fibers in said skin extending across the longitudinal axis of said member, wherein the improvement comprises at least one layer of fiber strands located between said limb portion and said skin in said transition portion from said loop to said neck portion, said layer of fiber strands extending from said transition portion around and forming an outer layer on said loop with said fiber strands in said outer layer extending in parallel with the fiber strands in said bundle which forms said loop, and in the region of said transition portion where said layer is located between said limb portions of said bundle and said skin said fiber strands forming said layer extend angularly across the longitudinal axis of said member with the angle of each said strand being different relative to the longitudinal axis.

4,255,088

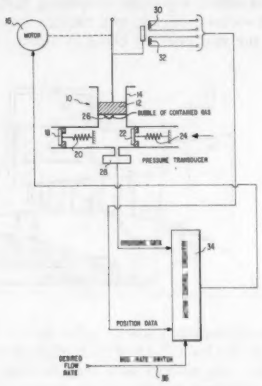
LIQUID PUMPING SYSTEM HAVING MEANS FOR DETECTING GAS IN THE PUMP

David W. Newton, Boulder, Colo., and John M. Gibilisco, Cedar Rapids, Iowa, assignors to Valleylab, Inc., Boulder, Colo.

Filed Jun. 14, 1979, Ser. No. 48,380

Int. Cl.³ F04B *49/00*

U.S. Cl. 417—1 **24 Claims**



1. Liquid pumping apparatus comprising

a pump for pumping a liquid; and

gas detecting means disposed in the pump for detecting within said pump the presence of gas which may undesirably affect the liquid delivery rate of said pump where said gas detecting means senses the compressibility of the fluid within said pump to determine the presence of said gas where said gas is compressible and said liquid is not.

4,255,089

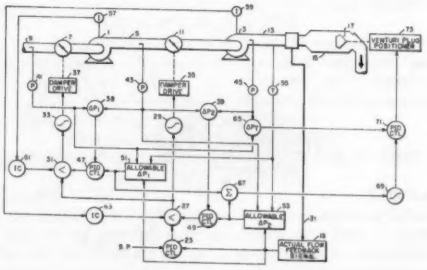
METHOD OF CONTROLLING SERIES FANS DRIVING A VARIABLE LOAD

William R. Phillips, Jr., and Ronald D. Tate, both of Denver County, Colo., assignors to Dravo Corporation, Pittsburgh, Pa.

Filed Mar. 22, 1979, Ser. No. 22,769

Int. Cl.³ F04B *41/06*

U.S. Cl. 417—2 **13 Claims**



1. A method of controlling two fans connected in series to drive a downstream variable load, said method comprising the steps of:

generating a single primary control signal representative of the total demand placed upon the two fans,

generating a piecewise linear characterization of the installed flow characteristics of each fan,

modifying the primary control signal as a function of the

piecewise linear characterization of each fan to generate a modified control signal for each fan, and

operating the control element of each fan as a function of the associated modified control signal, said piecewise linear characterizations being complementary such that the total demand placed upon the two fans is divided between the fans in a predetermined manner over the the range of said primary control signal.

4,255,090

MANUFACTURE OF POWERED AIR COMPRESSORS

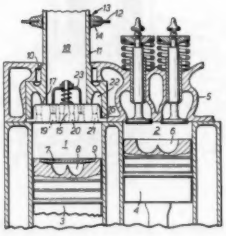
Anthony M. J. Pratt, The Bracken, Waterhouse La., Kingswood, Surrey, England

Filed Sep. 24, 1979, Ser. No. 78,101

Claims priority, application United Kingdom, Sep. 25, 1978, 37989/78

Int. Cl.³ F04B *41/04*

U.S. Cl. 417—53 **21 Claims**



1. A method of manufacturing a powered air compressor including providing a multi-cylinder liquid cooled internal combustion engine, machining one or more openings in the cylinder head of the engine above respective cylinders, attaching an insert in the or each opening suitable for receiving an air compressor valve, each insert being such as to seal the holes through the coolant jacket walls in the cylinder head resulting from the formation of the particular opening, and attaching an air compressor valve to the insert.

12. A powered air compressor comprising a multi-cylinder liquid cooled internal combustion engine having a cylinder head in which the valve gear and part of the cylinder head for at least one cylinder are removed, an insert attached to the cylinder head to seal the holes through the coolant jacket walls produced by the removal of the part of the cylinder head for each such cylinder and a compressor valve fitted to the insert, the arrangement being such that the or each cylinder with a compressor valve operates as an air compressor driven by the remaining cylinders of the engine.

4,255,091

STRUCTURAL UNIT FOR HYDRAULIC SYSTEMS

John H. Dike, Jr., Melrose, Mass., assignor to Dike Equipment Corporation, Stoneham, Mass.

Filed Feb. 5, 1979, Ser. No. 9,478

Int. Cl.³ F04B *21/00*

U.S. Cl. 417—63 **19 Claims**

1. A free-standing structural unit for use in a hydraulic system of the type including a variable displacement hydraulic transmission having a hydraulic output control, said structure being adapted for use with a variety of prime movers and hydraulically driven devices and comprising:

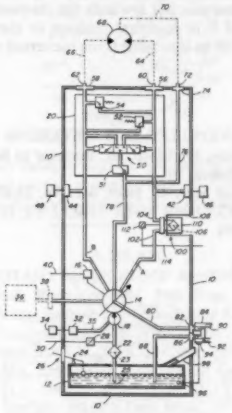
a protective housing defining an enclosure having housing mounting means and an access hatch;

a hydraulic fluid reservoir comprising an enclosed compartment within the housing;

means for mounting a variable displacement hydraulic transmission within the enclosure exterior to said reservoir;

means penetrating a wall of the housing for delivering shaft work to the transmission from any one of a variety of prime movers located exterior thereto;

means penetrating a wall of the housing for connecting the hydraulic lines of any one of a variety of hydraulically driven device to the exterior of the housing;



means penetrating a wall of the housing for transmitting a control signal to the output control of said transmission; and

means for mounting a filter in a hydraulic line within said enclosure, located to facilitate access to said filter.

4,255,092

HYDRAULIC VARIABLE-DISPLACEMENT AXIAL PISTON PUMP HAVING TORQUE LIMITATION

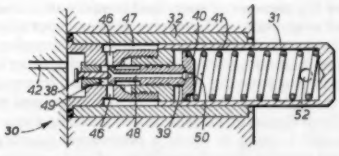
John A. Hudson, Highworth; Nicholas A. James, Kingswood, and Edward G. Morley, Charlton, all of England, assignors to Plessey Handel und Investments AG, Zug, Switzerland

Filed Oct. 3, 1978, Ser. No. 948,213

Claims priority, application United Kingdom, Nov. 24, 1977, 48887/77

Int. Cl.³ F04B *1/26*

U.S. Cl. 417—222 **4 Claims**



1. A hydraulic variable displacement axial piston pump comprising a swash means which tends to move to a deswashed condition when the pump is working, and a torque-limiting device, the torque limiting device comprising **(1)** a piston and cylinder arrangement having a movable member which when extended acts via the swash means to increase the displacement of the pump, **(2)** a spool, and **(3)** a spring which has one end acting on the spool and its other end acting on the movable member thereby placing the spool under a spring load which varies with the extension of the movable member, the spool being coupled to pump delivery pressure at its end remote from the spring and the spool being arranged to control the flow of fluid to the movable member, whereby a limitation of the on-swash condition of the swash means is obtained which is inversely proportional to the pressure at which the

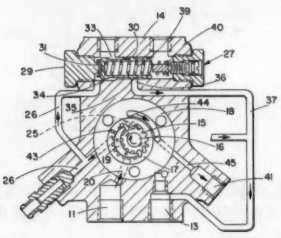
hydraulic fluid is discharged from the pump, the spool being movable between a first position in which the spool blocks fluid flow to the movable member and a second position permitting fluid flow to the movable member, the spool being urged towards the second position by the spring and being urged towards the first position by pump delivery pressure, said swash means moving towards the de-swashed condition when said spool is in said first position to thereby compress said spring so that an increased force is exerted on the spool by the spring.

4,255,093

COMBINED LIFT AND METERING PUMP

Robert W. Erikson, Rockford, Ill., assignor to Sundstrand Corporation, Rockford, Ill.

Filed Mar. 23, 1979, Ser. No. 23,428
Int. Cl.³ F04B *49/08*; F04C *2/10, 29/08*
U.S. Cl. 417—310 **6 Claims**



1. A metering pump including a housing, a drive shaft journaled within said housing, at least one rotatable pumping element within said housing, inlet and outlet chambers within said housing separated from each other but communicating with said pumping element, an inlet passage within said housing for connecting said inlet chamber with the source of fluid to be pumped, a discharge passage within said housing and having a relatively small fluid entry end defining a timing port selectively communicable with said outlet chamber for the discharge of fluid from said pump, means for regulating the pressure of fluid in said outlet chamber comprising passage means in parallel flow relation with said discharge passage and having a pressure regulator communicating with said outlet chamber and a return passage communicable with said pressure regulator for venting the fluid from said outlet chamber thereby to regulate the pressure of such fluid in said outlet chamber to a selected magnitude, said pumping element normally blocking fluid communication between said outlet chamber and the timing port of said discharge passage, and a metering orifice formed in said pumping element to establish intermittent fluid communication between said outlet chamber and the timing port of said discharge passage as said pumping element rotates within said housing to meter a preselected quantity of fluid from said pump with each revolution of said pumping element.

4,255,094

AUTOMATIC PRESSURE HOLDING ELECTROMAGNETIC PUMP

Atsushi Nomura, Tokorozawa, Japan, assignor to Nippon Control Ind. Co., Ltd., Tokyo, Japan

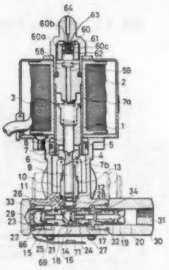
Filed Feb. 12, 1979, Ser. No. 11,567
Claims priority, application Japan, Mar. 4, 1978, 53/24633
Int. Cl.³ F04B *49/00*
U.S. Cl. 417—311 **5 Claims**

1. In an automatic pressure holding electromagnetic pump having a check valve at its suction side and a check valve at its discharge side, and having an electromagnetic plunger mechanically connected to a piston and an electromagnetic coil, the electromagnetic coil arranged to move said electromagnetic plunger to thereby cause a reciprocating motion of the piston thereby enabling a pumping action by the pump to thereby cause the flow of fluid out of said pump; the improvement comprising:

a decompression valve for throttling said flow of fluid out of said pump at said discharge side thereof for controlling the pressure thereof;

a pressure receiving plunger mechanically connected to said decompression valve for displacing said decompression valve, said fluid at said discharge side of said pump being applied to said pressure receiving plunger for displacing said pressure receiving plunger in dependence upon the pressure of said applied fluid;

a cylinder, said pressure receiving plunger slidably arranged in said cylinder;



a chamber arranged to communicate with said cylinder;

a pressure adjusting spring arranged in said chamber, said spring being positioned to face said pressure receiving plunger for applying a force thereto;

a return conduit connected to said suction side of said pump and extending to said chamber;

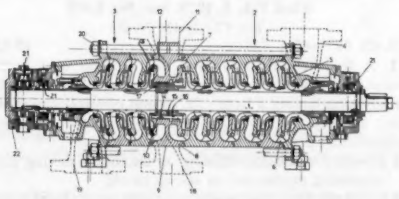
whereby said pressure of said electromagnetic pump is adjusted by the displacement of said decompression valve, the change in the displacement of said decompression valve causing a change in the magnitude of the throttling of said flow of fluid out of said pump, and wherein fluid leaking into said chamber is returned to said suction side of said pump through said return conduit.

4,255,095

TURBOPUMP

Loïc R. Y. Goulvestre, and Claude M. M. Lepert, both of Annecy, France, assignors to Pompes Guinard, Courbedie, France

Filed Jul. 17, 1979, Ser. No. 58,280
Claims priority, application France, Aug. 7, 1978, 78 23250
Int. Cl.³ F04B *17/00*
U.S. Cl. 417—406 **5 Claims**



1. A turbomachine comprising a pump with a rotor and a stator, said stator having an inlet and an outlet, a turbine having a rotor and a casing which has an inlet and an outlet distinct

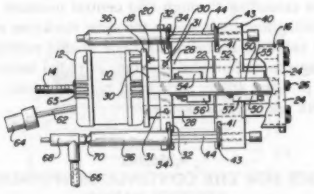
from those of the pump, the turbine rotor being fixed on a same shaft as the pump rotor and the pump and the turbine having respectively high-pressure ends, and an intermediate annular casing joining said ends and defining between an internal surface and an external surface thereof a pump volute and a turbine chamber on opposite sides of a plane perpendicular to said surfaces so that the intermediate casing is part of both of turbine liquid flowpath and the pump liquid flowpath, the intermediate casing further supporting a hydrostatic bearing whose chamber communicates with the pump.

4,255,096

DRIVE FOR SYRINGE PUMP

George M. Coker, Jr., Silver Spring, Md., and Rodolfo R. Rodriquez, Buffalo Grove, Ill., assignors to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Filed Jan. 8, 1979, Ser. No. 1,679
Int. Cl.[3] F04B *17/00*; A61M *5/20*
U.S. Cl. 417—415 **11 Claims**



1. A drive for a syringe having at least one barrel and plunger assembly, which drive comprises: an electric motor having a housing, a rotatable armature within said housing and an axial shaft extending therefrom and having a portion thereof which is threaded and which is received through a threaded member fixed to said armature; a first holder that is fixed relative to the electric motor housing; guide means that is fixed relative to said first holder and including a track extending parallel to said shaft for guiding a portion of said drive; a second holder rigidly fixed to said shaft and slidable along said track; said guide means preventing rotational but not axial movement of said shaft upon sliding movement of said second holder fixed to said shaft on said track; said track including two elongate members fixed relative to the electric motor housing, said members being parallel spaced from each other and said shaft, and being positioned on either side of said shaft; means for connecting one of the barrel and the plunger with said first holder; means for connecting the other of the barrel and the plunger to said second holder; and means for coupling the electric motor to a source of current whereby energization of the electric motor will provide non-rotational axial travel of said shaft thereby causing relative movement between the syringe plunger and the syringe barrel.

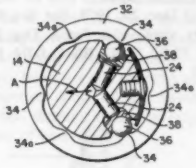
4,255,097

FUEL INJECTION PUMP

Charles W. Davis, Simsbury, and Charles J. Donahue, Enfield, both of Conn., assignors to Stanadyne, Inc., Windsor, Conn.

Filed Jul. 31, 1979, Ser. No. 62,356
Int. Cl.[3] F04B *29/00*
U.S. Cl. 417—462 **8 Claims**

1. A liquid fuel injection pump having a longitudinal bore, a rotary distributor journaled in the bore, the distributor providing a pair of generally radial communicating non-coaxial bores, a pair of pumping plungers slidably mounted in said non-coaxial bores to form a pumping chamber therebetween, and a cam ring mounted about the axis of rotation of the distributor and having cam lobes to impart simultaneous inward movement to the pumping plungers as the distributor rotates characterized in that the distributor and the longitudinal bore define chamber means therebetween, passage means in the distributor providing continuous communication between the chamber means and the pumping chamber with the chamber means being angularly disposed to create a hydraulic force on said distributor substantially radially aligned with but in a direction opposite to the radial vector of side loading imposed on the distributor during the pumping stroke of the pumping plungers.

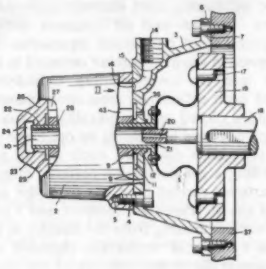


4,255,098

ROTARY VANE PUMP ASSEMBLY

Siegfried Hertell, Radevormwald, Fed. Rep. of Germany, assignor to Barmag Barmer Machinenfabrik Aktiengesellschaft, Remscheid-Lennep, Fed. Rep. of Germany

Filed Mar. 22, 1978, Ser. No. 888,877
Claims priority, application Fed. Rep. of Germany, Mar. 22, 1977, 7708877[U]; May 23, 1977, 7716231[U]
Int. Cl.[3] F04B *35/00*; F04C *29/02*
U.S. Cl. 418—76 **16 Claims**



1. In a rotary vane pump and in particular the type used for producing vacuum in motor vehicle power brake assistance units wherein a compensating coupling connects a relatively horizontally located pump drive shaft with the drive motor of the pump and a lubricant oil is supplied to the working elements of the pump from said drive motor, the improvement comprising:

a pot-shaped hood which has a closed end wall sealing off the free end of the drive shaft and which receives and circumferentially surrounds the working components of the pump and, in particular, the rotor and vanes; and

a mounting flange having a bell-shaped foot portion which is totally enclosed on its circumference surrounding the compensating coupling and a lid portion covering the open end of said pot-shaped hood, said bell-shaped foot portion being formed as an oil collector for the lubricant oil flowing out from said working components and having a suction pipe connection arranged relatively vertically in a cross-sectional plane thereof and then turning in a direction axially parallel to the pump drive shaft to open, after crossing the lid portion which is located between said pot-shaped hood and said bell-shaped foot portion, above said pump drive shaft in the suction chamber of the pump, and said lid portion having an outlet opening for discharging the lubricant oil and air from the working components of the pump, said outlet opening being located below said pump drive shaft.

4,255,099

OIL SEPARATOR FOR COMPRESSOR

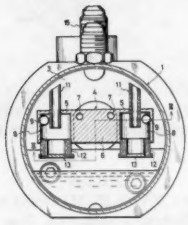
Haruyuki Komori, Chiba, Japan, assignor to Seiko Keiki Kabushiki Kaisha, Chiba, Japan

Filed Dec. 27, 1978, Ser. No. 973,588

Claims priority, application Japan, Dec. 29, 1977, 52-177968

Int. Cl.³ F04C *29/02;* **B04C** *5/04;* **B01D** *53/24*

U.S. Cl. 418—97 **3 Claims**



1. In a gas compressor having an outer compressor housing, an inner compressor housing having a compressor rotor therein, wherein said inner compressor housing is smaller than said outer compressor housing and disposed within said outer compressor housing and defines a pressure chamber within said outer compressor housing between said outer and said inner compressor housings, the improvement comprising: an oil separator within said outer compressor housing and within said pressure chamber, said oil separator comprising means defining a plurality of cylindrical separation chambers each having a respective gas inlet conduit oriented to introduced gas tangentially into its corresponding cylindrical separation chamber and each cylindrical separation chamber having an open end and a closed end, a plurality of gas-oil separation elements each disposed for closing an open end of a respective cylindrical separation chamber, each gas-oil separation element comprising a gas permeable material effective for separating oil particles carried by a gas from the gas as it passes through said gas-oil separation element, and a plurality of gas outlet pipes each extending from the interior to the exterior of a respective cylindrical separation chamber for providing communication between the interiors of the respective cylindrical separation chambers and the pressure chamber, wherein the respective ends of said gas outlet pipes remote from said cylindrical separation chambers terminate adjacent said outer compressor housing so that gas flowing out of said cylindrical separation chambers through said gas outlet pipes and carrying oil particles impacts against said outer compressor housing to effectuate gas-oil separation; and said inner compressor housing including gas outlet openings opening into the gas inlet conduits of said oil separator for separating oil particles carried by gas discharged from said inner compressor housing.

4,255,100

ROTARY COMPRESSOR WITH VALVE IN ROTOR

Ernst Linder, Mühlacker, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

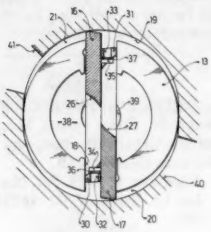
Filed Aug. 8, 1978, Ser. No. 932,025

Claims priority, application Fed. Rep. of Germany, Sep. 7, 1977, 2740201

Int. Cl.³ F04C *18/00, 29/08;* **F04B** *35/04*

U.S. Cl. 418—184 **13 Claims**

1. A rotary compressor comprising stationary means forming an inner space defined by an inner peripheral surface extending along an endless cam curve of oval configuration; inlet passage means for a fluid medium communicating with said inner space and having inner open ends at said peripheral surface; annular impeller means rotatably mounted in said stationary means and defining a central pressure space, said impeller means being provided with diametrically opposite slots; means carried by said impeller means for rotation therewith and having outer free ends engaging said cam curve for sucking the gaseous medium into said space and for compressing the medium, said means carried by said impeller means being constituted by a pair of vanes slidably arranged in said slots and abutting with side faces thereof against each other,



said vanes extending through said central pressure space and having throughout their length the same thickness and height; only two valve means carried by one of said rotatable means for passing the compressed medium in radial inner direction into said pressure space; and outlet passage means communicating with said pressure space.

4,255,101

DEVICE FOR THE CONTINUOUS SPINNING OF VISCOSE RAYON

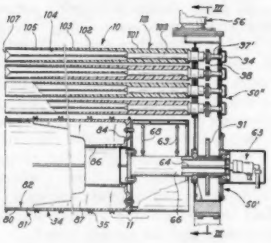
Ugo Paoletti, Monza, and Alessandro Volterra, Milan, both of Italy, assignors to SNIA Viscosa Societa' Nazionale Industria Applicazioni Viscosa S.p.A., Milan, Italy

Filed Apr. 9, 1979, Ser. No. 28,324

Claims priority, application Italy, Apr. 7, 1978, 22076 A/78; Sep. 29, 1978, 28324 A/78

Int. Cl.³ B29D *7/02*

U.S. Cl. 425—68 **21 Claims**



1. A spinning unit for the continuous spinning of viscose rayon, said unit comprising, in association with viscose feeding and coagulating means, means for feeding and applying treatment and wash liquors, a collecting tub for the liquors, and means for discharging the collected liquors:

treatment means for simultaneously treating a plurality of viscose rayon yarns, said treatment means comprising a single treatment roller having axially spaced therealong plural separate treatment zones through which each of said yarns is sequentially passed;

a plurality of advancing rollers, each said advancing roller advancing a single respective said yarn only, said advancing rollers having askew longitudinal axes, each said advancing roller having a diameter substantially smaller than the diameter of said treatment roller, and said advancing rollers being spaced from said treatment roller by varying distances;

a hollow support arm having a pair of spaced walls;

each of said treatment roller and said advancing rollers having on a first end thereof a pair of supports respectively housed and supported in said pair of walls of said support arm;

each of said treatment roller and said advancing rollers having a second end which is free and unsupported; and

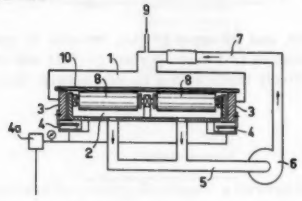
means positioned between said pair of supports of each of said treatment roller and said advancing rollers for imparting driving movement thereto.

4,255,102

MACHINE FOR TREATMENT OF LIGNOCELLULOSE CONTAINING BOARD MATERIALS WITH GASEOUS AGENTS

Olle Smedberg, and Kenneth Larsson, both of Oskarström, Sweden, assignors to Ry Aktiebolag, Oskarström, Sweden

Filed Jul. 9, 1979, Ser. No. 55,958
Claims priority, application Sweden, Jul. 7, 1978, 7807641
Int. Cl.[3] A01J *21/00*
U.S. Cl. 425—74 **6 Claims**



1. A machine for continuous treatment of a particle board having a first side and a second side and an edge defined between the first and second sides wherein a gaseous substance is applied to the board, said machine comprising:

(a) a first treating zone for applying the gaseous substance to a first surface area of the board; and

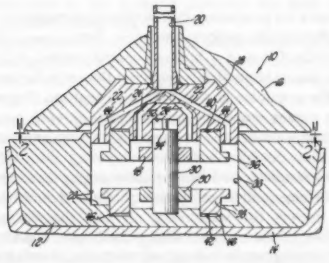
(b) a second treating zone opposed to said first treating zone for applying a negative pressure to a second surface area, said second treating zone drawing the gaseous substance from the first treating zone and through the board wherein the second surface area is less than the first surface area.

4,255,103

HOT CONSOLIDATION OF POWDER METAL-FLOATING SHAPING INSERTS

Walter J. Rozmus, Traverse City, Mich., assignor to Kelsey-Hayes Company, Romulus, Mich.

Filed May 18, 1979, Ser. No. 40,206
Int. Cl.[3] B22F *3/02, 3/14, 7/04;* B30B *11/00*
U.S. Cl. 425—78 **9 Claims**



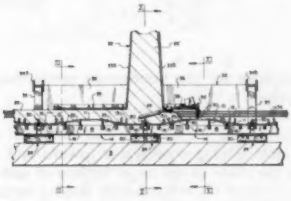
1. An assembly for hot consolidating powder in a container by heat and pressure comprising: a mass of container material substantially fully dense and incompressible and at least a portion of which is capable of plastic flow at pressing temperatures, said mass having interior walls forming a closed cavity of a predetermined shape and volume therein for receiving a quantity of powder with the said interior walls being movable to reduce said volume of said cavity for compacting powder therein into an article, at least one shaping means disposed in said cavity for defining a void in the article as the powder is compacted thereagainst, and force-responsive means for allowing relative movement between said shaping means and at least a portion of said interior walls of said cavity as powder is compacted against said shaping means in response to a force reducing said volume of said cavity.

4,255,104

SYSTEM FOR CASTING AND HANDLING CONCRETE RAILROAD TIES

Frederick M. Stinton, Woodbridge, Canada, assignor to Martin Concrete Engineering Company, Fort Worth, Tex.

Continuation-in-part of Ser. No. 933,283, Aug. 14, 1978, which is a division of Ser. No. 928,697, Jul. 27, 1978. This application Feb. 16, 1979, Ser. No. 12,609
Int. Cl.[3] B28B *23/06*
U.S. Cl. 425—111 **11 Claims**



1. A system for slip-forming concrete crossties in inverted orientation on an elongated casting bed, each crosstie having a plurality of prestressed cables embedded in the concrete, the system comprising:

a plurality of casting forms arranged side by side and end to end above the casting bed, each side of each casting form being disposed in an upright plane to sealingly engage depending sides of a relatively moving slip-form casting machine;

a plurality of carriage assemblies arranged end to end above the casting bed, each carriage assembly supporting a group of side-by-side casting forms;

means for supporting the carriage assemblies while permitting relative longitudinal movement of adjacent carriage assemblies; and

resilient sealing means disposed between the adjacent ends of the casting forms and forming a fluid seal therebetween, the sealing means extending to the upright planes to also form a fluid seal with the depending sides of the casting machine.

8. A machine for slip-forming prestressed concrete railroad crossties on a plurality of casting forms arranged side by side and end to end above a generally horizontal casting bed, the machine comprising:

a plurality of casting chambers each having a top plate and downwardly extending legs, each chamber cooperating with an underlying casting form to slip-form a concrete railroad crosstie in inverted orientation on the casting form as the machine moves longitudinally down the casting bed,

a casting hopper for depositing relatively low slump concrete into the casting chambers,

means for guiding prestressed cables into the concrete in precise predetermined positions at a point just ahead of where the cables are embedded in the concrete and,

pneumatically actuable means for urging the downwardly extending legs with a uniform force against cooperating

edges of the respective forms to maintain an essentially fluid tight seal therebetween.

4,255,105

EQUIPMENT FOR THE CONTINUOUS PRODUCTION OF FOAM BOARDS

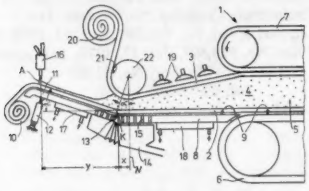
Erwin Hoffmann, Leverkusen; Werner Dietrich, Cologne-Dellbrueck, and Karl J. Kraft, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Bayerwerk, Fed. Rep. of Germany

Filed Oct. 18, 1979, Ser. No. 86,106

Claims priority, application Fed. Rep. of Germany, Jun. 15, 1979, 2924184

Int. Cl.[3] **B29D** *27/04*

U.S. Cl. 425—144 **9 Claims**



1. An apparatus for the continuous production of foam boards comprising:

(i) a conveyor

(ii) an inclined table at one end of said conveyor, the incline of said table sloping downwards toward said conveyor, wherein the plane of the upper surface of said conveyor and the plane of the downwardly sloping surface of said inclined table intersect forming an angle α of from 3° to 45°.

(iii) a foam mixture application device located

(iii) a foam mixture application device located above said downwardly sloping surface, and

(iv) a transverse foam mixture distribution device located downstream of said application device and above said conveyor, and having a convexly curved surface facing towards the sloping surface of said inclined table and towards the upper surface of said conveyor, the said distribution device being located such that the line formed by the intersection of a vertical plane through the center of curvature of said distribution device and the plane of the upper surface of said conveyor is X mm from the line of intersection of the planes of the downwardly sloping surface of said inclined table and of the upper surface of said conveyor, wherein

$$X=[(r+s)\cdot\tan.\ \alpha]\pm 20\%$$

where

r represents the radius of curvature of said distribution device in mm,

s represents the height in mm of the space between the upper surface of the conveyor and the lower surface of the distribution device.

4,255,106

MANUALLY FED DOUGH SHEETER

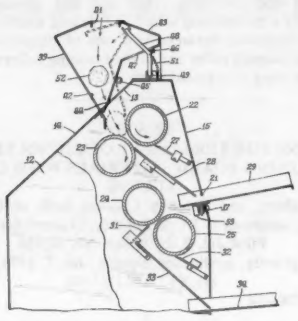
Richard J. Anetsberger, and John A. Anetsberger, both of Northbrook, Ill., assignors to Anetsberger Brothers, Inc., Northbrook, Ill.

Filed Sep. 24, 1979, Ser. No. 78,603

Int. Cl.[3] **A21C** *3/02*

U.S. Cl. 425—152 **9 Claims**

1. A dough sheeter, comprising dough sheeting rollers cooperating to roll out a dough piece presented thereto, a roller-enclosing casing, a dough piece receiving bin disposed above said casing providing a downward passage to said rollers and having an inlet aperture at its top, and guard mechanism having a lower portion normally blocking said passage to said rollers and movable by a dough piece dropped through said



inlet aperture, and an upper portion movable in response to such movement of said lower portion to close said inlet aperture to positively block access to said passage through said aperture.

4,255,107

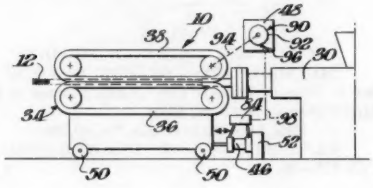
CONTROL APPARATUS FOR PRODUCING UNIFORM THICKNESS CORRUGATED TUBING

Larry L. Martin, Hamilton, Ohio, assignor to Advanced Drainage Systems, Inc., Columbus, Ohio

Filed May 26, 1978, Ser. No. 909,623

Int. Cl.[2] **B29C** *17/07;* **B29D** *23/18*

U.S. Cl. 425—163 **7 Claims**

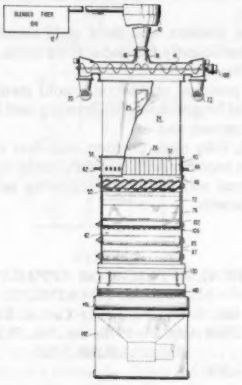


1. Apparatus for producing thermoplastic corrugated tubing having a substantially uniform thickness throughout comprising an extruder forming a hollow smooth-walled extrudate, corrugating means immediately adjacent the extruder arranged to receive the extrudate and to form corrugations therein, the corrugating means including continuously moving cooperating mold blocks configured to form alternating annular peak portions, valley portions and interconnecting side wall portions in the extrudate, and blow means urging the extrudate into intimate engagement with the configured mold blocks, motivating means for selectively moving the corrugating means relative to the extruder along the line of travel of the tubing, and timing means connected to the motivating means arranged to cause the extruder and the corrugating means to slightly move away from one another during formation of the annular valley portions and to slightly move toward one another during formation of the annular peak and interconnecting side wall portions.

4,255,108
FURNISH HANDLING APPARATUS

Joseph S. Bleymaier, Columbia, Md.; Wilfred Farnworth, Clinton, Wash., and Thomas E. Peters, Boise, Id., assignors to Morrison-Knudsen Forest Products Company, Inc., Boise, Id.

Filed Jan. 19, 1979, Ser. No. 4,858
Int. Cl.[3] B29D *3/02;* B29J *5/00*
U.S. Cl. 425—174.8 E 14 Claims



1. In apparatus for making fiberboard, a forming line providing for uninterrupted movement of lightweight fibrous furnish for delivery to and distribution over a preselected area of a continuously movable elongated support web to continuously form a mat of such furnish for compaction and curing into fiberboard, such furnish being moved continuously through the forming line without relying on pneumatic impulsion with movement of furnish in approaching and during orientation for deposition being in a direction which is substantially normal to the area of deposition and substantially free of air turbulence, comprising

means for continuously feeding lightweight fibrous furnish into a forming line substantially free of pneumatic impulsion,

conveyor means located downstream from and in vertically spaced relation to such furnish feeding means,

the conveyor means presenting such elongated support web and including means for controllably moving the elongated support web to present a surface of the preselected area for deposition of furnish

such controlled movement of the elongated support web establishing a forming direction for the mat being formed,

such preselected area of deposition having a dimension in the forming direction and a dimension perpendicularly transverse to the forming direction for such surface of deposition of furnish,

means for moving furnish which is continuously fed, into the forming line in a direction having a horizontal component and for continuously discharging furnish in the direction of the support web distributed over one of such dimensions of the preselected area of deposition,

a flow-through header chamber for receiving furnish distributed over such one dimension of the selected area of deposition and confining such furnish to a fractional portion of the remaining dimension of the preselected area of deposition,

metering means for continuously removing furnish from such header chamber in the direction of the support web,

means mechanically contacting such metered furnish to accelerate movement of such furnish in the direction of the support web,

means for uniformly distributing such furnish over the remaining dimension of such dimensions of the preselected area of deposition while maintaining such initial distribution of furnish in such one dimension,

such means for distributing furnish over such remaining dimension providing mechanical contact with such furnish and imparting a horizontal component of movement to the furnish along such remaining dimension to continuously deliver furnish uniformly distributed over substantially the full selected area of deposition,

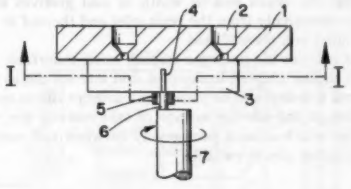
means for orienting such furnish in an electrical field, and

means for directing such furnish distributed over the full area of deposition toward such means for orienting such furnish for deposition on the continuously movable support web.

4,255,109
SPINNERET CLEANING DEVICE

Hermann Einmerich, Klingenberg, and Rudolf Ottmann, Aschaffenburg, both of Fed. Rep. of Germany, assignors to Akzona Incorporated, Asheville, N.C.

Filed May 23, 1979, Ser. No. 41,962
Claims priority, application Fed. Rep. of Germany, Jun. 9, 1978, 2825356
Int. Cl.[3] D01D *3/00*
U.S. Cl. 425—227 6 Claims



1. A portable device for cleaning operating spinnerets for molten synthetic polymers in a spinning housing comprising: at least one cleaning blade movable in a plane parallel to the face of the spinneret, said blade being fixedly attached to a base plate; a rotatable shaft and rotation means therefore; pin means eccentrically located on one end of the shaft for movably attaching the base plate thereto; a stop plate having means for aligning the device relative to said spinneret housing; means for positioning said shaft relative to said stop plate and constraining shaft movement of the shaft substantially toward the spinneret face, the movement in said pin means being sufficient to allow said cleaning blade to conform to said spinneret face and compensate for the difference in alignment between the spinneret housing and face.

4,255,110
APPARATUS FOR PRODUCING CORRUGATED FOAMED PLASTIC SHEET

Isao Otsuka, Utsunomiya, Japan, assignor to Japan Styrene Paper Corporation, Tokyo, Japan

Continuation of Ser. No. 872,239, Jan. 25, 1978, abandoned. This application Jun. 26, 1979, Ser. No. 52,918
Claims priority, application Japan, Feb. 15, 1977, 52/15297
Int. Cl.[3] B29F *3/04;* B29D *27/00*
U.S. Cl. 425—381 4 Claims

1. An apparatus for producing a corrugated foamed plastic sheet, said apparatus comprising:

extruder means for extruding plastic resin through one end thereof;

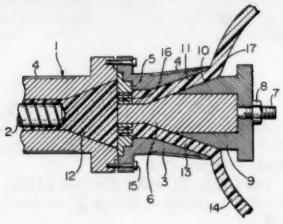
circular die means connected to the extrusion end of said extruder means for forming a corrugated foamed sheet from the plastic resin extruded from said extruder means, said die means being comprised of:

a hollow exterior die fitted onto the extrusion end of said extruder means;

a central mandrel within and spaced from said hollow exterior die;

an adjustable interior die affixed to the outside of said central mandrel, at least a portion of the exterior surface of said interior die being inside and spaced from the interior surface of said hollow exterior die, an extruded resin passageway being formed by the space between said central mandrel and said interior die and said exterior die;

said interior die having a plurality of grooves on the exterior surface thereof spaced from the interior surface of said



exterior die, said grooves extending to the outlet end of said passageway and said exterior surface of said interior die, the depth and/or width of said grooves increasing progressively from the resin inlet end thereof to the resin outlet end thereof; and

said exterior die having a smooth interior surface; and

bolt means adapted to connect said interior die to said central mandrel and to permit said interior die to move relative to the interior surface of said exterior die, whereby the width of said passageway between said interior and exterior dies is variable.

4,255,111

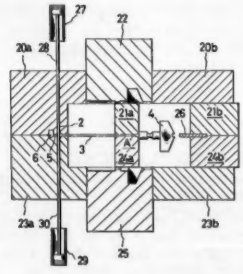
APPARATUS FOR MOLDING AND STRETCHING STOPPERS

Tadashi Suzuki, Kita-adachi, Japan, assignor to Sato Gosei Co., Ltd., Tokyo, Japan

Division of Ser. No. 851,191, Nov. 14, 1977, Pat. No. 4,198,370, which is a continuation of Ser. No. 643,768, Dec. 23, 1975, abandoned. This application Oct. 19, 1979, Ser. No. 86,526

Int. Cl.[3] **B29C** *1/00, 17/02;* **B29D** *31/00;* **B29F** *1/14*

U.S. Cl. 425—383 **8 Claims**



1. An apparatus for making stoppers by subjecting filament portions to stretching, said stoppers each including a crossbar, a filament portion having a longitudinal axis and a head molded integrally from synthetic resin, comprising:

first symmetrical opposed upper and lower mold members shaped for molding said crossbars;

second symmetrical opposed upper and lower mold members shaped for molding smaller-diameter filament portions adjacent said first mold members and movable along said longitudinal axis, said second mold members having opposed die means for drawing said filament; and

third symmetrical opposed upper and lower mold members shaped for molding larger diameter filament portions and said heads adjacent said second mold members and movable laterally of said longitudinal axis;

whereby, in sequence:

in a first, closed position, said first, second and third mold members form a single mold cavity for a plurality of stoppers;

in a second position, said third mold members are laterally opened sufficiently for said second mold members to pass longitudinally,

in a third position, said second mold members are moved along said longitudinal axis drawing said filament through said die means; and

in a fourth, fully open position, said first and second mold members together with said third mold members are laterally opened sufficiently for removing said stoppers from said apparatus.

4,255,112

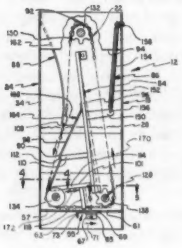
CHEMICAL APPLICATOR APPARATUS FOR MATERIAL TREATMENT

Joel D. Eck, Rte. 2, Box 82, Valley Center, Kans. 67417

Filed Aug. 29, 1979, Ser. No. 70,888

Int. Cl.[3] **B28B** *5/02*

U.S. Cl. 425—209 **10 Claims**



1. A chemical applicator apparatus adapted to dispense a controlled amount of substance into a conveyor structure; comprising:

(a) a main housing means to hold the substance therein and connected to the conveyor structure;

(b) a main drive means connected to said main housing means;

(c) an actuator and discharge means mounted in said main housing means and connected to said main drive means for operation thereof; and

(d) said actuator and discharge means moves to compress the substance into a capsule, move the capsule to a discharge opening, and forcefully ejects the capsule through said discharge opening.

4,255,113

FLUID-OPERATED PRESS

Takuzo Kurosawa; Seiki Dewa; Yuzuru Kikuchi, all of Hitachi, and Hisanobu Kanamaru, Katsuta, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Feb. 5, 1980, Ser. No. 118,741

Int. Cl.[3] **B29C** *3/00;* **B30B** *1/00*

U.S. Cl. 425—411 **9 Claims**

1. A fluid-operated press comprising:

a crosshead,

a bed,

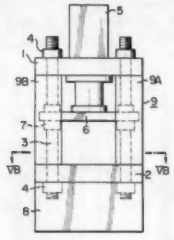
four upstanding posts extending between said crosshead and said bead,

said posts being of a rectangular arrangement with an axis of

each post extending vertically through each corner portion of a rectangular plane,

a slider disposed between said crosshead and said bead and slidably fitted on said posts to be slidable along the latter, and

upright wall means positioned outside said slider and said posts and clamped between said crosshead and said bed,



said upright wall means including a wall portion surrounding at least that portion of the peripheral surface of each of said posts which, as viewed in cross-section of said press through any vertical position of said upright wall means, is positioned between two lines obtained by extending two adjacent sides of a rectangle which is formed by connecting the center points of said posts.

4,255,114

OIL BURNER COMBUSTION PROCESS

Fred Aerne, CH-9620 Lichtensteig, Switzerland

Filed Jun. 26, 1978, Ser. No. 919,183

Claims priority, application Switzerland, Apr. 19, 1978, 4173/78

Int. Cl.³ F23D *21/00*

U.S. Cl. 431—2 **1 Claim**

1. A process for improving the combustion effect in an oil burner, comprising feeding a mixture of oil, atmospheric air, and added substantially pure oxygen through a jet of an oil burner having an orifice diameter of between 1/10 to 2/10 mm., said mixture being fed through said jet at a pressure of substantially 2 atmospheres, and projecting the said mixture from said jet of the oil burner into the combustion chamber of the oil burner in a power-charged combustible stream.

4,255,115

METHOD AND APPARATUS FOR PRODUCING A HOT GAS FLOW

Johannes W. Graat, Overasselt, and Hans T. Remie, Nijmegen, both of Netherlands, assignors to Smit Ovens Nijmegan B.V., Nijmegen, Netherlands

Filed Feb. 28, 1979, Ser. No. 16,304

Claims priority, application Fed. Rep. of Germany, Mar. 2, 1978, 2808874

Int. Cl.³ F23C *7/00*; F23L *9/06*

U.S. Cl. 431—10 **18 Claims**

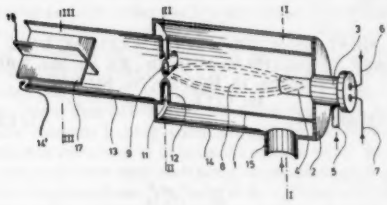
1. A method of producing a hot gas flow by combustion of preferably liquid fuels, characterized by the following steps:

(a) atomizing the liquid fuel to form fine particles;

(b) further atomizing the thus generated fuel particles with the aid of combustion air supplied as atomizing medium, and reducing the mean fuel particle diameter to less than one-half of the mean diameter obtained in step (a);

(c) burning the fuel-air mixture within a flame cone extending on an axis A, under stoichiometric conditions or with an excess of oxygen within an air duct;

(d) introducing a stream of a gaseous medium, in a plane E extending through said flame cone substantially perpendicularly to axis A, within a portion of the flame cone which, by turbulence, residence time and temperature of said medium, provides in the flame for sufficient heating



which avoiding as far as possible the production of harmful substances.

4,255,116

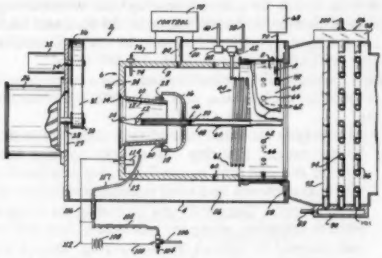
PREVAPORIZING BURNER AND METHOD

Eugene B. Zwick, 16841 Edgewater La., Huntington Beach, Calif. 92649

Filed Sep. 22, 1975, Ser. No. 615,166

Int. Cl.³ F23D *11/44*

U.S. Cl. 431—11 **14 Claims**



1. A burner comprising

a burner body having a combustion zone and a secondary dilution zone;

a first inlet opening into said combustion zone and a second inlet opening into said secondary dilution zone;

a tertiary dilution zone and a third inlet opening into said tertiary dilution zone;

said secondary dilution zone being positioned downstream from said combustion zone and said tertiary dilution zone positioned downstream from said secondary dilution zone;

said first inlet opening having a first flow area and said second inlet opening having a second flow area with the ratio of said first area to said second flow area being maintained constant;

an air passage to supply air to said first, second and third inlet openings;

a flow controller positioned to control the air flow through said third inlet opening with air passing from said passage through said first and second inlet openings when said controller is in a closed position and the air flow passing from said passage through said first, second and third inlet openings when said controller is in an opened or partially opened position;

means to vary the fuel flow to said combustion zone in response to the temperature within said zone;

fuel vaporizer means within said burner body and positioned downstream from said secondary dilution zone and upstream from said tertiary dilution zone, and

the ratio between said first and second inlet openings being sufficient to provide a quantity of cooling air through the second inlet openings which reduces the temperature of

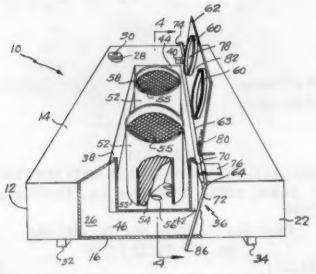
exhaust gases from the combustion zone to a level which vaporizes fuel within the fuel vaporizer means without thermally degrading the fuel to cause coking.

4,255,117

HEAT SOURCE FOR FOOD WARMING UNIT

Richard L. Trotta, 1109 Timberlea Dr., Bel Air, Md. 21014

Filed Sep. 15, 1978, Ser. No. 942,810
Int. Cl.³ F23D *3/26*
U.S. Cl. 431—34 **13 Claims**



9. A heat source for a food warming unit, which comprises:
fuel tank means for containing a liquid fuel and including burner means positioned therein in communication with said liquid fuel; and
means for extinguishing said burner means upon disturbance of said fuel tank means, said extinguishing means including:
a lid pivotally mounted to said tank means adjacent said burner means, a spring operatively coupled between said lid and said tank means for urging said lid to cover said burner means, and a rod member coupled to said lid so as to pivot therewith and including an integral leg portion extending along the side of said fuel tank means and adapted to contact the underlying support surface of said fuel tank means so as to maintain said lid in an open position during normal operation and to release said lid under the force of said spring upon disturbance of said tank means.

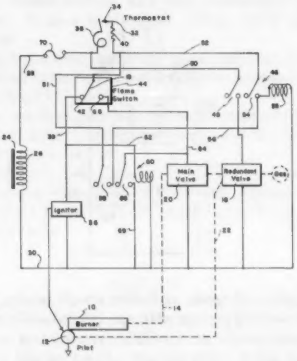
4,255,118

ELECTRIC IGNITION SYSTEM

Jay R. Katchka, Cypress, Calif., assignor to Robertshaw Controls Company, Richmond, Va.

Filed Apr. 20, 1978, Ser. No. 898,175
Int. Cl.³ F23Q *9/08*
U.S. Cl. 431—46 **3 Claims**

1. An ignition and control system for a burner assembly including a main fuel burner, a main fuel supply line connected to said main fuel burner, a pilot burner operative to ignite fuel discharged from said main burner, and a pilot fuel supply line connected to said pilot burner, said system comprising:
first and second normally closed valves for location in said pilot fuel and main fuel supply lines, respectively said first valve being a solenoid type valve having an actuator coil;
flame sensing means adjacent said pilot burner and including flame switch means responsive to heat to move between a cold position and a hot position upon exposure to said flame for a predetermined period of time;
heating demand means comprising a thermostat having a pair of electrical contacts;
ignition means operative to ignite fuel discharged from said pilot burner;
first control circuit means coupled to said pair of contacts of said thermostat and, through said flame switch means, to said cold position, and energizable in response to said heating demand means to operate said ignition means, said ignition means being rendered inoperable upon movement of said flame switch means from said cold position;
second control circuit means, including a relay having contact means in circuit with said actuator coil and responsive to energization of said first control circuit means to open said first valve; and



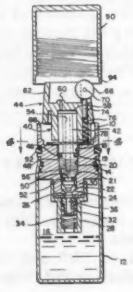
third control circuit means coupled to said pair of contacts of said thermostat and, through said flame switch means, to said hot position, and energizable in response to said heating demand means to open said second valve.

4,255,119

REFILLABLE GAS BURNING LIGHTER

Kenneth R. White, and John P. Hancock, both of Indianapolis, Ind., assignors to K-Whit Tools Incorporated, Indianapolis, Ind.

Filed Apr. 30, 1979, Ser. No. 34,460
Int. Cl.³ F23Q *25/00*
U.S. Cl. 431—150 **23 Claims**



1. A refillable, liquefied gas burning lighter, comprising
a body having an axial fuel passage therein,
a fuel reservoir for supplying fuel to the passage,
a burner port,
a check valve closing in the direction to block flow from the reservoir through the passage,
a manual shut-off valve for controlling flow of fuel from the passage to the burner port,
means operable when the shut-off valve is open and the check valve closed for supplying gas from the reservoir to said passage at a restricted rate for supporting ignition at the burner port,
said shut-off valve including a valve plug which is removable from the body and which thereby exposes the fuel

passage for insertion of a fill nozzle against the check valve in a direction to open the same to pass fuel from such nozzle to the reservoir.

4,255,120

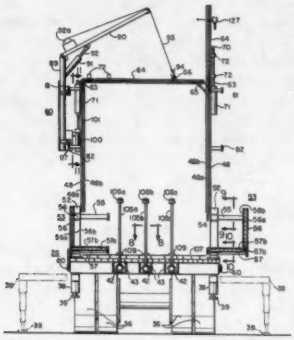
PORTABLE SAFETY FLARE FOR COMBUSTION OF WASTE GASES

John F. Straitz, III, c/o Combustion Unlimited Incorporated, Ste. 721, Benjamin Fox Pavilion, Jenkintown, Pa. 19046

Filed Dec. 5, 1978, Ser. No. 966,614

Int. Cl.³ F23D *13/20*

U.S. Cl. 431—202 **24 Claims**



1. A portable safety flare for waste combustible gases comprising

a movable vehicle having a bed and a connection for the delivery thereto of waste gas for combustion,

a plurality of header members on said bed for discharge of waste gas supplied through said connection for combustion in a combustion space,

said bed having front, rear and side walls extending upwardly therefrom in surrounding relation to the combustion space, and

wall panels carried by said walls and movable to upright positions.

4,255,121

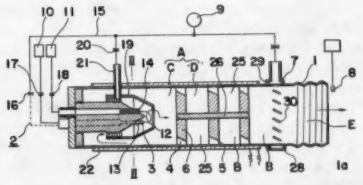
GASEOUS FUEL CONTAINING WATER, APPARATUS THEREFOR

Takeshige Sugimoto, Tosayama, Japan, assignor to Eces Co. Ltd., Kochi, Japan

Filed Aug. 14, 1978, Ser. No. 933,576

Int. Cl.³ F23D *11/44*

U.S. Cl. 431—208 **3 Claims**



1. An apparatus for producing a gaseous fuel containing water, said apparatus being in the form of a cylinder comprising a supply end for introducing air, liquid fuel and water, and at the other end an open outlet for transferring exhaust gases out of the cylinder; means for swirling the gaseous flow around an axis centrally located within the cylinder; a pump connected to the cylinder for supplying primary compressed air into the supply end of the cylinder; at least one supply device comprising a nozzle means for injecting and atomizing water and said liquid fuel individually or in admixture into the cylinder by means of the primary compressed air; means for heating the gaseous mixture in said cylinder; means for repeatedly increasing and decreasing the pressure within the cylinder of the swirling gaseous mixture, which pressure variation is effected by vaporizing the water and liquid fuel or mixtures thereof by means of the primary air flow along the axis of the cylinder, said pressure increasing or decreasing means comprising more than two nozzles for controlling the pressure; metallic elements located within the cylinder for contacting the gaseous mixture so as to cause the gaseous water, fuel and air mixture to react with each other; means of supplying secondary compressed air to the outlet of the cylinder wherein the secondary air mixes with the gaseous mixture of primary air, fuel and water in said cylinder and which secondary air is introduced within the cylinder in an amount sufficient to forcibly blow said gaseous mixture out of the outlet; said cylinder containing ignition means near the outlet of the cylinder for igniting the mixture of the reactive gases and secondary air.

4,255,122

APPARATUS FOR COMBUSTING LIQUID, GASEOUS OR POWDERED FUELS

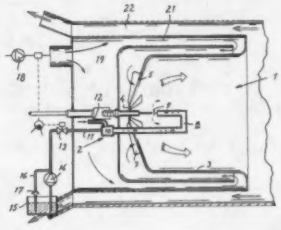
Jan A. Alpkvist; Rolf G. A. Törnkvist, and Lars R. Würzig, all of Linköping, Sweden, assignors to Forenade Fabriksverken, Eskiluna, Sweden

Filed Feb. 16, 1978, Ser. No. 878,260

Claims priority, application Sweden, Feb. 23, 1977, 7701991; Feb. 23, 1977, 7701992

Int. Cl.³ F23D *11/44*

U.S. Cl. 431—215 **15 Claims**



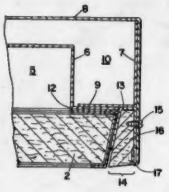
1. Apparatus for combusting fuels comprising a combustion chamber having air inlet means at the bottom thereof for introducing combustion air and having a relatively wide burner tube, a substantial length of which is located inside the combustion chamber and which opens inside the combustion chamber and which is turned twice at about 90° at each turn, characterized in that the burner tube opens inside the combustion chamber with a mouth facing the bottom of the combustion chamber substantially co-axially therewith, in that an inlet end of the burner tube is located outside the combustion chamber and is connected to a mixing chamber, in which both fuel and some amount of combustion air is introduced and mixed before the fuel-air mixture is brought to flow through the burner tube, in that the combustion chamber is surrounded by an air chamber providing a labyrinth channel through which combustion air is passed to the air inlet means at the bottom of the combustion chamber while being preheated, and, in that the air chamber includes an inlet air receiving chamber provided behind the combustion chamber and connected to the labyrinth channel, whereby combustion air is supplied to the labyrinth channel from the inlet air receiving chamber.

4,255,123

NON-WARPING RADIANT BURNER CONSTRUCTION

William J. Bishilany, III, Seven Hills; Arnold L. Buehl, Solon, and Werner H. Zwipf, Parma, all of Ohio, assignors to Slyman Manufacturing Corporation, Cleveland, Ohio

Filed May 11, 1979, Ser. No. 38,216
Int. Cl.³ F23D *13/12, 13/14*
U.S. Cl. 431—328 **9 Claims**



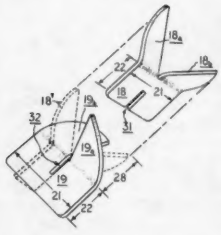
1. A radiant burner comprising an inner box which has a shelf around its edges, an outer box, a refractory fiberboard matrix with edges being beveled outwardly, porous resilient refractory means wedged between the edges of the matrix and the sides of the outer box to overlap said beveled edges and retain the edge portions of the matrix on the inner box shelf, the inside of the inner box and the matrix defining the plenum chamber for the combustion mixture, the outside of the inner box and the inside of the outer box defining the plenum chamber for the cooling air, means to supply a combustion mixture and cooling air respectively to the combustion plenum chamber and cooling air plenum chamber, slot openings between the edges of the inner box and the sides of the outer box outside of the shelf for the passage of cooling air through said porous refractory means, and a refractory sealant on the edges of the matrix to rigidify them and seal them against the combustion mixture, the said sealed edges being inwardly disposed from said porous refractory means, whereby the matrix is retained on the inner box shelf and the combustion mixture burns in the outside surface of the matrix inwardly from the sealed edges.

4,255,124

STATIC FLUID-SWIRL MIXING

Frank Baranowski, Jr., 7 Pine St., Lynnfield Center, Mass. 01940

Filed Oct. 5, 1978, Ser. No. 948,961
Int. Cl.³ F23D *15/02*
U.S. Cl. 431—353 **4 Claims**



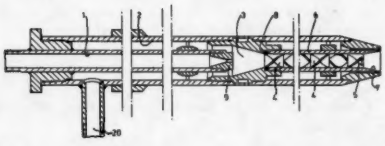
1. A static mixer combination in a gas torch of the type in which a high-velocity combustible gaseous stream flows through the substantially cylindrical bore of a flame tube, comprising relatively thin mixer members having upstream support portions of springy sheet metal, said support portions of said members having longitudinally extending peripheral edges engaging longitudinally extending inner wall surfaces of said bore and elsewhere extending only substantially in radial directions within said bore, said support portions being of complementary configurations promoting their cooperating self-support of said members within said bore and subdividing said bore into plural flow passageways extending linearly along said tube, and flow-deflecting vane portions projecting downstream from support portions of said members as thin integral extensions thereof, said flow-deflecting vane portions being substantially flat and laterally bent to incline from said support portions at substantially the same angle and to one side, referenced to one angular direction about the longitudinal axis of said bore, said angle being in the range of about 40 to 60 degrees, said vane portions being inclined fully into curved peripheral engagements with inner wall surfaces of said bore, said flow-directing portions being bent from bifurcated ends of two mixer members each having support portions of width substantially equal to the diameter of said bore, said support portions of said two members having complementary slots midway therealong which accommodate mutually-perpendicular crossed interfittings therebetween in a longitudinally-aligned mated relationship, and each of the four vane portions being inclined to one side corresponding to one angular direction about the center of the crossed members, whereby said vane portions intercept flow through said passageways and promote substantially helical coursing of the flow downstream thereof in said flame tube.

4,255,125

MIXING APPARATUS AND THE USES THEREOF

Michel Auclair, and Louis Le Parmentier, both of Mont-Saint-Aignan, France, assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Continuation of Ser. No. 757,390, Jan. 6, 1977, abandoned, which is a continuation-in-part of Ser. No. 525,076, Nov. 19, 1974, abandoned. This application Dec. 15, 1978, Ser. No. 969,807
Int. Cl.³ F23D *13/40*
U.S. Cl. 431—354 **5 Claims**



1. Apparatus for use in the atomization of combustible materials, comprising in combination:

(a) an atomization zone having an inlet and an outlet end, said zone being cylindrical in shape and having a uniform cross-section;

(b) a chamber connected adjacent said inlet end of said atomization zone and including a cross-section greater than said cross-section of said zone;

(c) a first inlet for said chamber for feeding combustible material therein and a second inlet for said chamber for feeding an auxiliary gas therein;

(d) means adjacent said outlet end of said atomization zone for modifying the profile of atomized combustible material which exits therefrom; and

(e) mixing means internally secured in said atomization zone for the length thereof for imparting to said combustible material and auxiliary gas flowing therethrough a multiple shearing action and change in rotational direction thereof along the length of said zone, said mixing means comprising a plurality of vanes along the length of said atomization zone having longitudinally spaced opposed to transverse extending edges, with adjacent edges of said vanes being in contact and angularly disposed with respect to each other, and wherein the end one of said vanes adjacent said outlet end of said atomization zone is shorter in length than the remaining ones of said vanes in said atomization zone.

4,255,126
FURNACE TILTING DEVICE

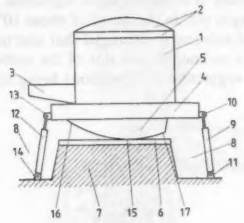
Karl Bühler, Nussbaumen, Switzerland, assignor to BBC Brown Boveri & Company Limited, Baden, Switzerland

Filed Sep. 28, 1979, Ser. No. 80,772

Claims priority, application Switzerland, Sep. 28, 1978, 10120/78

Int. Cl.³ F27B *14/02*; C21C *5/42*

U.S. Cl. 432—1 **9 Claims**



1. Apparatus for tilting a two-way tilting furnace with a spout side and a back-tilting side, comprising:

at least one rolling rocker upon which the furnace is support;

base means for supporting said at least one rolling rocker with a point of contact defined between said at least one rolling rocker and said base means, said point of contact moving toward said spout side as said furnace is tilted toward the spout side and moving toward said back-tilting side as said furnace is tilted toward the back-tilting side;

first means for selectively exerting a first force at the back-tilting side of the furnace in an upward direction;

second means for selectively exerting a second force, in a downward direction and simultaneously with said first force, at the spout side of the furnace whereby said furnace may be selectively tilted to a pouring position with both an effective lever arm of said first force on said furnace about said point of contact progressively increasing in magnitude and an effective lever arm of said second force on said furance about said point of contact progressively decreasing in magnitude, as said point of contact moves toward the spout side;

third means for selectively exerting a third force at the spout side of the furnace in an upward direction; and

fourth means for selectively exerting a fourth force, in a downward direction simultaneously with said third force, at the back-tilting side of the furnace, whereby said furnace may be selectively tilted to a back-tilting position, with both an effective lever arm of said third force on said furnace about said point of contact progressively increasing in magnitude and an effective lever arm of said fourth force on said furnace about said point of contact progressively decreasing in magnitude, as said point of contact moves toward the back-tilting side.

4,255,127
SKID RAIL INSULATION MEMBER AND METHOD OF INSTALLING SAME

Anthony J. Skifano, Des Plaines, Ill., and Melvin L. Bouts, Oak Hill, Ohio, assignors to Plibrico Company, Chicago, Ill.

Filed Jul. 31, 1979, Ser. No. 62,324

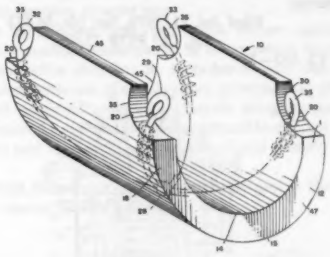
Int. Cl.³ F27D *1/16, 3/02*

U.S. Cl. 432—3 **8 Claims**

7. The method of affixing a precast insulating member to a skid pipe having a rub rail mounted thereon, including the steps of,

positioning a U-shaped precast insulating member, having a crisscrossed shaped rod portion and coil structure portion wrapped around said rod portion within said insulating member with said rod portion having exposed end-eye portions extending outwardly from the insulating member thereon, about a skid pipe,

bending the exposed end-eye portions of said rod portion



into engagement with the skid pipe to provide a mechanical locking of the insulating member to the pipe, and

filling the exposed surface of the pipe with a closure insulating material to insulate and seal the skid pipe.

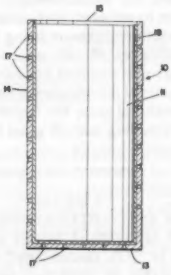
4,255,128
CONTAINER FOR BAKING CARBON PRODUCTS

Arvind C. Thekdi, Sylvania, Ohio, assignor to Midland-Ross Corporation, Cleveland, Ohio

Filed Jan. 26, 1979, Ser. No. 6,598

Int. Cl.³ F27D *5/00, 13/00*

U.S. Cl. 432—5 **8 Claims**



6. A method of baking carbon products in a baking furnace, where the carbon products release volatiles and liquid tars during baking, which comprises:

placing a porous medium on the base of a continuous porous walled container having a porous base;

wrapping the unbaked carbon product in the porous medium;

placing the wrapped carbon product into the container;

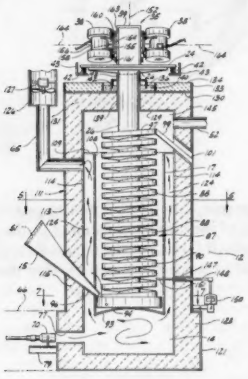
baking the carbon product, in the container and porous medium, in a carbon baking furnace where the volatiles and liquid tars released during baking pass through the porous medium and out of the porous container into the baking furnace while allowing high rates of heat transfer to the carbon product.

4,255,129

APPARATUS AND METHOD FOR PROCESSING ORGANIC MATERIALS INTO MORE USEFUL STATES

Roger D. Reed, and Elmer E. Reed, both of Washington County, Mo., assignors to Thomas N. DePew, St. Louis, Mo., a part interest

Filed Jul. 11, 1979, Ser. No. 56,513
Int. Cl.[3] F27B *15/00*
U.S. Cl. 432—13 51 Claims



29. A method for processing an organic material into charcoal comprising heating a processing chamber having lower and upper ends for causing within said chamber at said lower end a preselected temperature greater than a further temperature within said chamber at the upper end, at least partly closing said chamber to air to control the amount of oxygen contained therein, feeding said organic material in the form of aggregate pieces into said chamber at said lower end, conveying said pieces upward in said chamber by continuous vibratory action along a spiral path for causing said pieces of material to travel along said path in said chamber in a predetermined unterval of time, said vibratory action causes individual one of said pieces of material while being conveyed to undergo randomized motion for indiscriminant, uniform exposure of each of said pieces to ambient temperatures within said chambers, said preselected temperature being sufficient for converting volatile constituents of said material to a gaseous state thereby to convert said material to charcoal and provide off-gases from said material during conversion thereof to charcoal, transferring the material from the upper end of said chamber for cooling, and removing said off-gases from said chamber for further use.

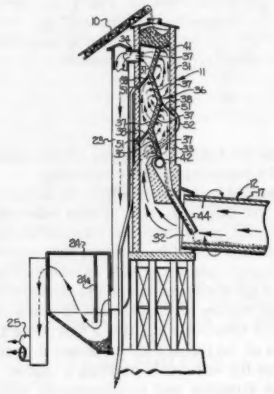
4,255,130

APPARATUS AND METHOD FOR TREATING AN AGGREGATE MATERIAL WITH A FLOWING GAS

Allen S. Johnson, Jr., P.O. Drawer 1037, Salisbury, N.C. 28144

Filed Oct. 26, 1979, Ser. No. 88,522
Int. Cl.[3] F27B *15/00*
U.S. Cl. 432—14 15 Claims

1. In an apparatus for heat treating a solid aggregate, said apparartus including a rotary kiln having an elongate tubular rotatable body through which the aggregate is advanced and including means for directing a heated gas through said tubular body in a direction countercurrent to the movement of the aggregate for heating the aggregate to elevated temperature, the combination therewith of an aggregate preheater cooperating with said kiln for utilizing the heated gases which are discharged from said kiln for preheating the aggregate prior to introduction thereof into said kiln to thus significantly reduce the energy requirements for heat treatment of said aggregate while also significantly increasing the production capacity of said kiln, said preheater comprising means defining a pair of gas permeable retaining walls of nonlinear zigzag configuration extending generally vertically in opposing, spaced relation to one another to define an elongate generally vertically extending gas permeable passageway of relatively narrow cross section adapted for receiving aggregate at the upper end thereof and confiningly directing the aggregate along a predetermined downward path of travel in the form of a relatively thin layer, each of said opposing gas permeable retaining walls being comprised of a series of laterally extending spaced apart slats interconnected to define inclined segmental wall portions inclined at an angle within the range of about 10° to about 25° from the vertical axis and so arranged that alternate segmental wall portions are inclined to one side of the vertical axis, with the intervening segmental wall portions being inclined to the



opposite side of the vertical axis and with the slats of the opposing series being convergingly arranged and inclined angularly downwardly in the direction of movement of the aggregate and positioned in overlapping relation to one another to assist in guiding the aggregate along its downward path of travel while confining the aggregate within the passageway and while also readily permitting the flow of heated gas into and through the thin layer of aggregate, and means for receiving the heated gases from said kiln and directing the gases upwardly along a predetermined sinuous path of travel repeatedly passing laterally through each of the inclined segmental wall portions so as to repeatedly direct the gases through the thin layer of aggregate in said passageway to provide highly effective contact of the heated gases with the aggregate.

4,255,131

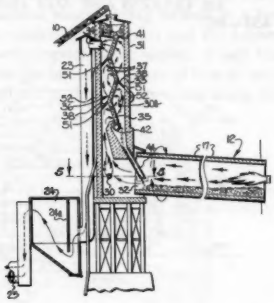
APPARATUS AND METHOD FOR HEATING AN AGGREGATE MATERIAL

Allen S. Johnson, Jr., P.O. Drawer 1037, Salisbury, N.C. 28144

Continuation-in-part of Ser. No. 88,522, Oct. 26, 1979. This application Nov. 19, 1979, Ser. No. 95,446
Int. Cl.[3] F27B *15/00, 7/02;* F26B *17/12*
U.S. Cl. 432—14 23 Claims

1. In an apparatus for heat treating a solid aggregate, said apparatus including a rotary kiln having an elongate tubular rotatable body through which the aggregate is advanced and including means for directing heated gases through said tubular body in a direction countercurrent to the movement of the aggregate for heating the aggregate to elevated temperature, the combination therewith of an aggregate preheater cooperating with said kiln for preheating the aggregate prior to introduction thereof into said kiln to thus significantly reduce the energy requirements for heat treatment of said aggregate while also significantly increasing the production capacity of said kiln, said preheater comprising means defining an elongate

generally vertically extending gas permeable passageway of relatively narrow cross section adapted for receiving aggregate at the upper end thereof and confiningly directing the aggregate along a predetermined downward path of travel in the form of a relatively thin layer, means for receiving the heated gases from said kiln and directing the gases upwardly along a predetermined sinuous path of travel repeatedly pass-



ing laterally through said gas permeable passageway so as to repeatedly direct the gases through the thin layer of aggregate in said passageway, and supplemental heating means cooperating with said receiving and directing means for further heating the gases from said kiln so that the thus heated gases will rapidly bring the aggregate to a preheated condition as the heated gases are directed into contact with the aggregate.

4,255,132

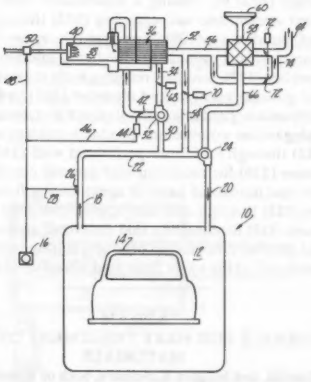
INCINERATOR-HEATER SYSTEM

Maximilian K. Carthew, Troy, Mich., assignor to Schweitzer Industrial Corp., Madison Heights, Mich.

Filed Sep. 12, 1979, Ser. No. 74,645

Int. Cl.³ F26D 7/04; F27B 9/04

U.S. Cl. 432—21 **13 Claims**



1. An incinerator-heater system for a heat energy requiring primary process, which process develops combustible effluent contained in an air mass at the process site, which air is required to be heated for execution of the primary process, the system comprising:

an incinerator-heater burner, and combustion chamber housing said burner, and means for circulating air to and from said site of said primary process with said air from said site of said primary process containing said combustible effluent;

means for recirculating at least a portion of said air flow from said site of said primary process into said combustion chamber;

means for incinerating said effluent in said combustion chamber;

means for returning at least a portion of said incinerated air to said incinerator process site;

means for modulating said incinerator burner operation through a predetermined range of temperature levels in said combustion chamber in accordance with the heat energy requirements of said primary process, said predetermined range of temperature levels being above the level required to incinerate said combustible effluent contained in said air flow from said site of said primary process;

whereby said incinerator-heater burner operates as the heat energy source for said primary process.

4,255,133

METHOD FOR CONTROLLING FURNACE TEMPERATURE OF MULTI-ZONE HEATING FURNACE

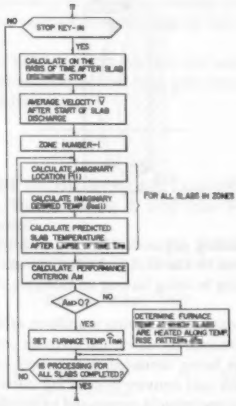
Shinya Tanifuji, and Yasuo Morooka, both of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Apr. 10, 1979, Ser. No. 28,705

Claims priority, application Japan, Apr. 10, 1978, 53/41185; Aug. 28, 1978, 53/103938

Int. Cl.³ F27D 7/00

U.S. Cl. 432—24 **11 Claims**


NO
STOP KEY-IN
YES
CALCULATE ON THE BASIS OF TIME AFTER SLAB DISCHARGE STOP
AVERAGE VELOCITY V AFTER START OF SLAB DISCHARGE
ZONE NUMBER=1
CALCULATE IMAGINARY LOCATION Pi(1)
CALCULATE IMAGINARY DESIRED TEMP. θdi(1)
CALCULATE PREDICTED SLAB TEMPERATURE AFTER LAPSE OF TIME Tm
FOR ALL SLABS IN ZONE
CALCULATE PERFORMANCE CRITERION Δai
Δai>0?
NO
YES
DETERMINE FURNACE TEMP. AT WHICH SLABS ARE HEATED ALONG TEMP RISE PATTERN
SET FURNACE TEMP. Tfm
IS PROCESSING FOR ALL SLABS COMPLETED?
NO
YES

1. For use with a multi-zone heating furnace having a plurality of zones, zone temperature sensors for sensing the zone temperatures, zone temperature control means for controlling the zone temperatures based on deviations of the output signals of the zone temperature sensors from set values of the zone temperatures, fuel flow rate control means for controlling flow rates of fuel supplied to burners in the respective zones in response to the output signals of the zone temperature control means, a method of controlling furnace temperatures comprising the steps of:

(a) computing flow rates of fuel in a plurality of slab temperature rise patterns in which at least one of slabs to be charged into the furnace or remaining in the furnace will be heated to a predetermined slab temperature at discharge;

(b) selecting a slab temperature rise pattern which results in the minimum one of the fuel flow rates computed in the preceding step;

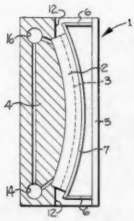
(c) predicting a desired discharge temperature of a slab at a predetermined later time from the present point of time based on the slab temperature rise pattern selected in the preceding step;

(d) performing prediction computation of a slab temperature at a predetermined later time based on the slab temperature at the present point of time;
(e) finding a deviation between the desired discharge temperature predicted in step (c) and the slab temperature computed in step (d);
(f) correcting a set point temperature of an associated zone based on the deviation in temperature obtained in step (e); and
(g) controlling the associated zone temperature so as to cause same to correspond to the set point temperature thus corrected.

4,255,134
YARN HEATING APPARATUS

Heinz Schippers, and Peter Dammann, both of Remscheid-Lennep, Fed. Rep. of Germany, assignors to Barmag Barmer Maschinenfabrik Aktiengesellschaft, Remscheid, Fed. Rep. of Germany

Filed Sep. 27, 1979, Ser. No. 79,483
Claims priority, application Fed. Rep. of Germany, Sep. 30, 1978, 7829136[U]
Int. Cl.³ F27B 9/28
U.S. Cl. 432—59 **9 Claims**

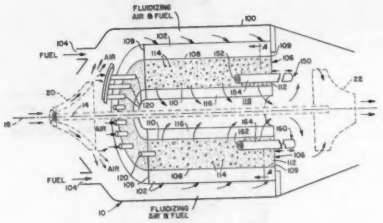


1. A yarn heating apparatus for use in a false twist yarn crimping machine or the like, and comprising
a heat insulating housing having an elongate channel formed therein,
an elongate heater plate having a uniform arcuate curvature in the longitudinal direction and an outer convex face, said heater plate being mounted within said channel of said housing with said convex face facing outwardly,
heating means operatively connected to said heater plate for elevating the temperature thereof,
an elongate cover hingedly connected to said housing for movement about a longitudinally directed axis and between a closed position covering said channel and overlying said heater plate, and an open position,
a flexible sealing member means having an inner face which has a length and curvature which is adapted to generally conform to the length and curvature of said convex face of said heater plate, and
means mounting said sealing member to the inside of said cover such that the convex surface of said heater plate and the inner face of said sealing member define a passage of substantially uniform cross-sectional configuration along the length of said heater plate and said inner face of said sealing member directly and conformingly contacts said convex face of said heater plate when said cover is closed,
whereby when the cover is open, access is permitted to the heater plate to facilitate insertion of a yarn therealong, and when the cover is closed, the uniform cross-sectional configuration of said passage minimizes the heat loss normally resulting from air flowing through the passage by permitting the laminar flow of such air.

4,255,135
APPARATUS FOR PREHEATING A ROTATABLE FLUIDIZABLE BED

George B. Grim, Washington, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

PCT No. PCT/US7900945, §371 Date Nov. 5, 1979, §102(e) Date Nov. 5, 1979.
This PCT application filed Nov. 5, 1979, Ser. No. 117,587
Int. Cl.³ F27B 7/08, 7/10, 15/00
U.S. Cl. 432—107 **15 Claims**



1. A rotating fluidized bed combustor (**10**) for exothermically reacting a gaseous agent and a fuel comprising:
a. an outer elongated perforated wall (**108**);
b. an inner perforated wall (**110**) spaced apart and substantially coaxial and co-extensive with said outer perforated wall (**108**);
c. enclosing walls (**109**) defining with said outer and inner perforated walls (**108,110**) a fluidization chamber (**112**);
d. a bed of pulverulent solid particles (**114**) in said chamber (**112**);
e. at least one heater (**150,160**) in thermal communication with said bed for preheating said bed (**114**) to at least the ignition temperature for said exothermic reaction;
f. means (**14**) for rotating said chamber (**112**) about the axis (**18**) to cause the particles to centrifugally gravitate toward said outer perforated wall (**108**);
g. means (**102**) for feeding a combustible fuel in a gaseous agent stream into said chamber (**112**) through said outer perforated wall (**108**), said gaseous agent having flow characteristics suitable for fluidizing said particles in said chamber (**112**), said fuel reacting with at least a portion of said gaseous agent in said chamber (**112**) to form gaseous combustion products, said unreacted gaseous agent and said gaseous combustion products exiting said chamber (**112**) through said inner perforated wall (**110**);
h. means (**116**) for receiving said gaseous combustion products and unreacted gaseous agent exiting from said chamber (**112**) through said inner perforated wall (**110**); and
i. means (**118**) for directing said unreacted gaseous agent and said gaseous combustion products exiting said inner perforated wall (**110**) away from said chamber (**112**).

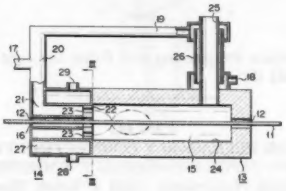
4,255,136
FURNACE FOR HEAT TREATMENT OF WIRE MATERIALS

Teruo Suzuki, and Shigeru Kuwabara, both of Yokohama, Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Kawasaki, Japan

Continuation of Ser. No. 900,319, Apr. 26, 1978, abandoned.
This application Feb. 13, 1980, Ser. No. 121,034
Claims priority, application Japan, Apr. 30, 1977, 52-55934
Int. Cl.³ F27B 9/28
U.S. Cl. 432—143 **2 Claims**

1. A furnace for the heat treatment of wire materials, comprising a cylindrical furnace body having holes at both ends through which a wire material is inserted into and out of the furnace body, a combustion chamber formed within the fur-

nace body, a burner provided at one end portion of the furnace body and adjacent to the combustion chamber, and a discharge pipe mounted near the downstream edge of the combustion chamber for discharging the waste gas, said burner comprising a free space through which the wire material is inserted, a fuel-air mixture chamber surrounding the free space, and injection nozzles communicating with the fuel-air mixture chamber, and serving to inject the fuel-air mixture into the combustion chamber, said injection nozzles being formed in a boundary wall between the combustion chamber and the burner in an inclined fashion with respect to the surface of said boundary wall so as to permit the injected streams of fuel-air mixture to make whirling motions in the same direction along the inner



wall of the combustion chamber in such a manner as to be free from direct contact with the wire material running along the axis of the combustion chamber; said boundary wall comprises a planar surface completely separating said combustion chamber and said burner, said planar surface being perpendicular to said axis and abutting the inner wall of said combustion chamber;

said combustion chamber inner wall comprising means for radiantly heating said wire material when said fuel-air mixture is injected into said combustion chamber, thereby enabling the wire material to be synergetically heated by both flames whirling along the inner wall of the combustion chamber and heat radiated from said inner wall.

4,255,137

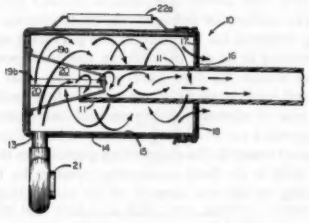
PORTABLE END HEATER FOR PLASTIC HOSE

Nathan E. Guyer, Stoneham, Mass., assignor to American Biltrite, Inc., Cambridge, Mass.

Filed May 29, 1979, Ser. No. 43,365

Int. Cl.³ F24J *3/00*; F27D *5/00*

U.S. Cl. 432—225 **10 Claims**



1. A portable device for heating an end portion of thermoplastic comprising:

an insulated metal cylindrical enclosure having an apertured end for receiving such hose;

at the other end of said cylinder, support means for immobilizing such hose end portion within said enclosure; and;

gas direction means for directing a stream of heated gas helically around the inner and outer surfaces of such hose along the length of the end portion.

4,255,138

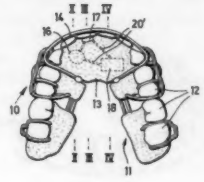
APPARATUS FOR USE IN MAXILLARY ORTHOPAEDICS

Hermann-Josef Frohn, Am Römerlager 4, D-5300 Bonn 1, Fed. Rep. of Germany

Filed Aug. 31, 1979, Ser. No. 71,500

Int. Cl.³ A61C *7/00*

U.S. Cl. 433—6 **21 Claims**



1. For use in maxillary orthopaedics wherein a moulding means which can be pressed against the teeth is worn in the mouth to adjust the position of the teeth, an apparatus for measuring the wearing time of said moulding means, comprising:

a time-measuring device carried by said moulding means and actuated by a switch, also carried by said moulding means, when the moulding means is held in the mouth, said time-measuring device comprising an electric circuit including an electronic counter connected to an impulse generator, and

a battery, said time-measuring device and said battery being encased and accommodated in at least one cavity formed in the moulding means.

4,255,139

ORTHODONTIC APPLIANCE

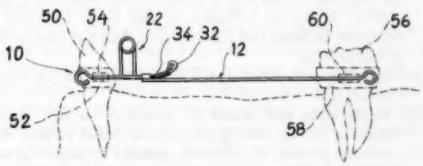
Csaba Ladanyi, Bahnhofstrasse 6, DM 7530 Pforzheim, Fed. Rep. of Germany

Filed Sep. 14, 1978, Ser. No. 942,307

Claims priority, application Fed. Rep. of Germany, Sep. 17, 1977, 7728871

Int. Cl.³ A61C *7/00*

U.S. Cl. 433—21 **7 Claims**



1. An orthodontic appliance for moving a tooth comprising first and second wire members displaceable relative to each other in a longitudinal direction, a guiding member displaceably mounted on said first wire member, said second wire member having one portion secured to said guiding member and another portion for attachment to a stable tooth, said first wire member having a partial attachment to said tooth to be moved and another portion being displaceably guided along said second wire member by means of said guiding member, a helical pressure spring carried by said first wire member engaging said second wire member and said guide member for biasing said wire member for relative displacement, said first wire member forming a second spring for biasing said wire members and providing vertical flexibility, said second spring comprising two upwardly extending legs and more than one helical turn located between said legs.

4,255,140

APPARATUS AND METHOD FOR DENTAL IMPRESSIONS

Kenneth H. Marshall, Castlecrag, Australia, assignor to Johnson & Johnson Dental Products Company, East Windsor, N.J.

Filed Jun. 6, 1979, Ser. No. 45,818
Int. Cl.[3] A61C *5/04, 9/00*
U.S. Cl. 433—40 8 Claims

1. Apparatus for forming a dental impression of a reduced tooth comprising

a dental impression syringe,

a rigid adaptor removably secured to said dental syringe, and

a flexible tubular member having a proximal end removably secured to said adaptor and a distal end adapted to fit snugly over the reduced tooth, the tip of said distal end being contoured to the general shape of the gingival margin of said tooth.

4,255,141

METHOD FOR MARKING TIGHT DENTAL CASTING

Helmut H. Schroeder, 205 E. Third Ave., San Mateo, Calif. 94401

Filed Sep. 12, 1979, Ser. No. 74,710
Int. Cl.[3] A61C *0/00*
U.S. Cl. 433—68 4 Claims

1. A metod for indicating undesired occlusions between a first dental surface of a mounting and a second dental surface of a prosthetic device, said indicating being on said second dental surface, such that undesired occlusions can be eliminated, said method comprising the steps of:

(a) applying a thin, uniform film of an adhesive liquid to said first dental surface;

(b) abutting said first dental surface to said second dental surface, said second dental surface being substantially dry, thereby to transfer a residue of said liquid to points of occlusion between said first dental surface and said second dental surface;

(c) removing said second dental surface from said first dental surface; and thereafter

(d) highlighting said points of occlusion on said second dental surface by dusting said second dental surface with a colored powder in sufficient quantity to adhere to said residue on said second dental surface, whereby said points of occlusion are indicated.

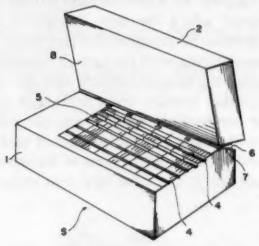
4,255,142

CUTTING INSTRUMENT FOR A ROOT CANAL FILLER IN DENTAL TREATMENT

Mitsuhiro Aoyagi, 45-15 Nankoudai-Higashi, 1-chome, Izumi-shi, Miyagi-ken, Japan

Filed Apr. 27, 1979, Ser. No. 33,785
Claims priority, application Japan, May 15, 1978, 53/64829[U]
Int. Cl.[3] A61C *19/00, 19/04*
U.S. Cl. 433—72 5 Claims

1. A cutting instrument for a root canal filler in dental treatment, comprising a base portion and cover means pivotably attached to one side of said base portion, said base portion being provided on its upper surface with a slot to receive therein a root canal filler, said slot being graduated for dimensioning the root canal filler, and said cover means having a



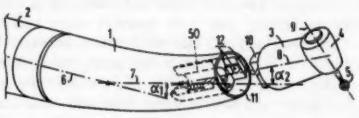
pressing surface for pressing and fixing the root canal filler placed in said slot.

4,255,143

DEVICE FOR RELEASABLY CONNECTING TWO PARTS OF A DENTAL HANDPIECE TOGETHER

Werner Schuss, Heppenheim; Hans J. Klose, Hemsbach, and Hermann Landgraf, Heppenheim, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Dec. 18, 1979, Ser. No. 104,980
Claims priority, application Fed. Rep. of Germany, Dec. 22, 1978, 2855682
Int. Cl.[3] A61C *1/08*
U.S. Cl. 433—126 13 Claims



1. A device for releasably connecting two parts of a dental handpiece together comprising coacting means being provided on the two parts for preventing twisting between said parts and for guiding said parts on a path from a beginning of a connection until stop surfaces of said parts abut to define a final connecting position, said coacting means having at least one axial guidance surface; and connecting means for releasably holding the two parts together in the final connecting position including at least one pair of coacting connecting elements mounted on said parts, one connecting element of each pair having an engagement surface for engaging the other element of the pair and being mounted for rotation on one part with said engaged surface moving in an arc between an unlocked position and a position at which the two parts are in the final connecting position and said connecting means including resilient means for each pair of elements acting on said one element to urge said engagement surface along said arc at least during the last part of travel towards the connecting position so that said two parts are held in the final connecting position by the resilient means acting on the one element of the connecting means.

4,255,144

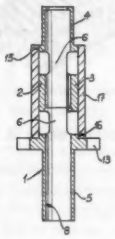
DEVICE FOR FIXING A DENTAL INSTRUMENT IN A HANDPIECE

Henri Leonard, Besancon, France, assignor to Micro-Mega S.A., France

Filed Apr. 30, 1979, Ser. No. 34,678
Claims priority, application France, Jun. 1, 1978, 78 16972
Int. Cl.[3] A61C *1/14*
U.S. Cl. 433—127 4 Claims

1. In the head of a dental handpiece, the combination of

dental instrument clamping means comprising axially spaced coaxial tubular pivot portions, a pair of semi-cylindrical and diametrically opposed clamping portions disposed between said pivot portions, said clamping portions being separated from one another by axial slots and each being connected by torsion by portions with said pivot portions, bearing means in said head rotatably supporting said pivot portions, a pinion fixed on one of said pivot portions for driving said instrument



clamping means in rotation, each of said pivot portions having adjacent its junction with said torsion bar portions a circular land having a diameter at least approximately equal to the outer diameter of said semi-cylindrical clamping portions and a cylindrical sleeve of flexible and sterilization-resistant material enclosing said clamping portions and having opposite ends force-fitted on said lands of said pivot portions to provide a fluid-tight seal between the interior and exterior of said instrument clamping means.

4,255,145

DENTAL TOOL HAVING SEVERABLE SECTIONS

Bernard Weissman, New York, N.Y., assignor to IPCO Hospital Supply Corporation, White Plains, N.Y.

Continuation-in-part of Ser. No. 928,557, Jul. 27, 1978, Pat. No. 4,205,444, and a continuation-in-part of Ser. No. 887,173, Mar. 16, 1978, Pat. No. 4,202,101. This application Sep. 20, 1979, Ser. No. 77,399

Int. Cl.³ A61C *1/10*

U.S. Cl. 433—165 **10 Claims**

1. A dental tool such as a drill, burr, anchor, reamer and the like, which is receivable in a dental tool holder for operative positioning thereof with respect to teeth of a patient, said dental tool comprising:

a body member being provided with an operative end portion for association with the teeth and a shank extending from the operative end portion for association with the tool holder;

said shank including at least two cylindrical sections, each section having a circumferential groove defining a neck portion for selectively receiving a retaining member of the hand tool according to a selected longitudinal extension of said shank from the hand tool, each neck portion separating a respective head portion from a respective body portion of each section; and

a longitudinally extending flat surface disposed along each section crossing the respective head and neck portions of the associated section and terminating along its respective body portion in a shoulder for selectively engaging a ledge in the tool holder to provide secure driving engagement with the tool holder, said shank further including frangible means located between the body portion of one section and the head portion of the next adjacent section for facilitating severence of one section from the next section thereby shortening the longitudinal extension of said shank to permit convenient access to operative areas of the patient's mouth.

4,255,146

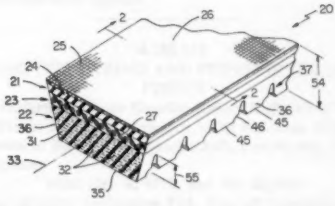
ENDLESS POWER TRANSMISSION BELT AND METHOD OF MAKING SAME

Paul M. Standley, Springfield, Mo., assignor to Dayco Corporation, Dayton, Ohio

Filed Jun. 11, 1979, Ser. No. 47,539

Int. Cl.³ F16G *5/16*

U.S. Cl. 474—251 **16 Claims**



1. In an endless power transmission belt made primarily of polymeric material and comprising; a compression section; a load-carrying section bonded against said compression section; and a tension section bonded against said load-carrying section; said compression section having opposed sides and means for stress relief of said belt during operation thereof around associated sheaves; the improvement wherein such stress-relief means comprises, a plurality of cavities disposed between said load-carrying section and the inner surface of said belt, said cavities extending into said compression section from each of said sides with each of said cavities defining a corresponding roughly concave surface, each concave surface having a top arcuate portion opening downwardly toward the inner surface of said belt and a bottom arcuate portion opened outwardly toward its associated side, said cavities providing said stress relief by minimizing cracking tendencies in said compression section of said belt and reducing the aggressiveness of said belt during operation thereof around said sheaves resulting in a comparatively cool running belt, said cavities being disposed in cooperating pairs along said belt, each cooperating pair of cavities being on opposite ends of a rectilinear line disposed perpendicular to a longitudinal axis of said belt, said top arcuate portion intersecting its associated belt side on a first radius with said bottom arcuate portion extending into said compression section on a second radius which is greater in length than said first radius.

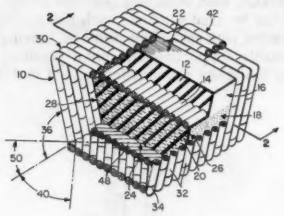
4,255,147

WRAPPED-MOLDED V-BELT AND METHOD OF MANUFACTURE

Joseph P. Miranti, Jr., Nixa, Mo., assignor to Dayco Corporation, Dayton, Ohio

Filed Nov. 8, 1979, Ser. No. 92,307
Int. Cl.[3] F16G *5/08;* B29H *7/22*
U.S. Cl. 474—262 **27 Claims**

1. An endless power transmission belt having a trapezoidal cross-section comprising a belt body and a cord fabric cover layer, said cord fabric comprising a plurality of substantially parallel strength cords, said cover layer surrounding said belt body, having an overlap, and bonded thereto, wherein said strength cords along each of the nonparallel sides extend at substantially the same first angle relative to the longitudinal axis of said belt, and said strength cords along the bottom of said belt extend at a second angle relative to said longitudinal



axis, wherein said second angle is different from said first angle.

4,255,148

PROCESS AND APPARATUS FOR MACHINE WASHING AND CLEANING WITH LOW-PHOSPHATE OR PHOSPHATE-FREE WASHING SOLUTIONS

Elmar Reinwald, Dusseldorf-Holthausen; Milan J. Schwuger, Haan; Heinz Smolka, Langenfeld, and Peter Krings, Krefeld, all of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien (Henkel KGaA), Dusseldorf-Holthausen, Fed. Rep. of Germany

Continuation of Ser. No. 618,461, Oct. 1, 1975, abandoned. This application Jan. 26, 1978, Ser. No. 872,561

Claims priority, application Austria, Oct. 3, 1974, 7969/74

Int. Cl.³ B08B *3/00*

U.S. Cl. 8—137 **12 Claims**

1. A method for machine washing and cleaning of soiled textiles utilizing washing and cleaning solutions essentially containing up to 2.5 gm/l of surface-active compounds, from 0.05 to 2 gm/l of water-soluble sequestering agents for calcium, as well as water-insoluble cation-exchange agents which are capable of binding the hardness components of the water and the soil, wherein said cation-exchange agent has a calcium binding capacity of from 100 to 200 mg of CaO/gm and consists of a crystalline compound of the formula $(M_2O)_x.Al_2O_3.(SiO_2)_y$ wherein M is lithium, sodium or potassium, x is a number from 0.7 to 1.1 and y is a number from 1.3 to 3.3, which contains bound water, and wherein said cation-exchange agent has an average particle size of more than 20μ and is not brought into contact with said soiled textiles in a washing area but is instead located in an external filter element, separate from said soiled textiles being washed in said washing area, which comprises agitating said soiled textiles in the presence of said washing and cleaning solution wherein the total amount of washing solution containing surfactants is continuously or intermittently cyclically circulated from said washing area through the external filter element charged with the cation-exchange agent, and then back to the washing area at least 5 times during the cleaning process, and where the amount of the cation-exchange agent is 0.2 gm to 10 gm per liter of washing solution.

4,255,149

ABRASION RESISTANCE AND STRENGTH OF COTTON-CONTAINING FABRIC MADE RESILIENT WITH N-METHYLOLACRYLAMIDE-TYPE REAGENT

Stanley P. Rowland; Florine A. Blouin, both of New Orleans, and Frederick F. Shih, Metairie, all of La., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Jan. 31, 1979, Ser. No. 8,129

Int. Cl.³ D06M *13/40*; C08C *61/22*

U.S. Cl. 8—184 **7 Claims**

1. A chemical process for imparting to cellulosic textiles high levels of resilience together with retention of high levels of abrasion resistance, breaking strength, and tearing strength, the process comprising:

(a) impregnating a cellulosic textile with an aqueous solution containing an N-methylolacrylamide-type reagent, an acidic or acid-generating water-soluble initiator for vinyl polymerization of monomers containing $H_2C{=}CH{-}$ units, and an alkali metal phosphate,

(b) drying the web impregnated textile, and

(c) curing the dried impregnated textile.

4,255,150

METHOD OF PRINTING PILE FABRICS

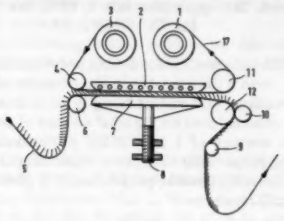
Peter Fennekels, Kempen-Hüls, and Herbert Schütze, Grefrath, both of Fed. Rep. of Germany, assignors to Girmes-Werke A.G., Grefrath, Fed. Rep. of Germany

Continuation of Ser. No. 760,549, Jan. 19, 1977, abandoned, which is a division of Ser. No. 464,464, Apr. 26, 1974, Pat. No. 4,018,066. This application Dec. 21, 1978, Ser. No. 972,159

Claims priority, application Fed. Rep. of Germany, Apr. 28, 1973, 2321592

Int. Cl.³ D06P *5/00, 7/00*

U.S. Cl. 8—471 **3 Claims**



1. Method of printing pile fabrics, said pile containing thermoplastic fibres, comprising the steps of thermoprinting a pattern onto said pile fabric with a thermoprinting web in a heating zone in which said pile fabric is exposed to a content pressure against said thermoprinting web such that about 40 to 60% of said pile is compressed, and immediately afterwards relief-forming and/or surface-forming said pile fabric while it is still hot, with a pattern which bears a strict relationship to said thermoprinted pattern.

4,255,151

PROCESS FOR DYEING AND PRINTING CELLULOSE FIBRES

Volker Hederich; Günter Gehrke; Robert Kuth, all of Cologne, and Werner Kühnel, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

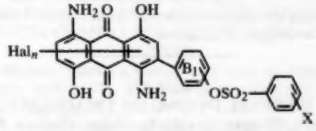
Filed Oct. 4, 1979, Ser. No. 81,969

Claims priority, application Fed. Rep. of Germany, Oct. 24, 1978, 2846229

Int. Cl.³ D06P *3/82*; C09B *1/50*

U.S. Cl. 8—532 **3 Claims**

1. In the dyeing and printing cellulose fibers applying to said fibers an aqueous solution of a water-miscible swelling agent capable of maintaining the fibers in swollen condition after removal of water, boiling above 150° C. and having dispersed therein an anthraquinone dye which is free from sulphonic acid and carboxylic acid groups, and thereafter heating to fix the dye, the improvement which comprises employing as said anthraquinone a compound of the formula



wherein

Hal is chlorine or bromine,

n is 0, 1 or 2,

B_1 is a phenylene radical which is optionally substituted by halogen, C_1–C_6-alkyl, hydroxyl, C_1–C_4-alkoxy, 2',3'—$(CH{=}CH)_2$—, phenyl or cyclohexyl, and

X is hydrogen, fluorine, chlorine, bromine, hydroxyl,

C_1–C_4-alkoxy, hydroxyethyl, cyano, C_1–C_4-alkoxycarbonyl, C_1–C_4-alkyl or C_1–C_4-alkylmercapto.

4,255,152

PROCESS FOR THE DYEING OF HYDROPHOBIC FIBRES

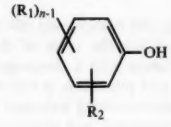
Brian Hewitt, Holmes Chapel; Cyril Hobday, East Didsbury; James Jack, Bramhall, and John F. E. Keenan, Cheadle Hulme, all of England, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation of Ser. No. 762,070, Jan. 24, 1977, abandoned, which is a continuation of Ser. No. 543;197, Jan. 22, 1975, abandoned. This application Sep. 5, 1978, Ser. No. 939,583

Int. Cl.³ D06P *5/04*

U.S. Cl. 8—583 **24 Claims**

1. A batchwide process for dyeing polyester fibres at 110° C. to 135° C. with a disperse dye in the presence of an adduct in aqueous medium, said adduct being in an amount from 0.05% to 2% by volume based on the total volume of the medium and having an average of 1 to 4 molar proportions of ethylene oxide, propylene oxide or styrene oxide or a combination of these oxides with 1 molar proportion of a phenol compound having the formula



(1)

in which

n is a number from 1 to 4,

R_1 is hydrogen, chlorine, an alkyl group with 1 to 8 carbon atoms, an alkoxy group with 1 to 8 carbon atoms or an alkenyl group with 2 to 8 carbon atoms,

R_2 is a cycloalkyl group with 5 to 8 carbon atoms which is unsubstituted or substituted by one or more alkyl groups containing 1 to 4 carbon atoms, a cycloalkenyl group with 5 to 8 carbon atoms, a phenylalkyl group having 1 to 3 carbon atoms in the alkyl part and which is unsubstituted or substituted by an alkyl group with 1 to 4 carbon atoms in the benzene nucleus, an aralkenyl group containing 2 or 3 carbon atoms in the alkenyl part, or a $COOR_3$ group in which R_3 is phenyl, phenyl substituted by alkyl having 1 to 4 carbon atoms, aryloxyalkyl in which the alkyl part contains 2 or 3 carbon atoms and the aryl part is unsubstituted or substituted by one or more chlorine or one or more alkyl groups with 1 to 4 carbon atoms, or a phenylalkyl having 1 to 3 carbon atoms in the alkyl part and which is unsubstituted or substituted by alkyl of 1 to 4 carbon atoms in the benzene nucleus or a phenylhydroxyethyl group and with the proviso that

(a) the total number of aliphatic carbon atoms in $(R_1)_{n-1+R2}$ does not exceed 8

(b) the total number of aliphatic carbon atoms in $(R_1)_{n-1}$ when R_2 is alicyclic or phenylalkyl is 2, and

(c) when the adduct is derived from styrene oxide, R_2 can be hydrogen or chlorine.

4,255,153

DISPERSE DYEING OF TRIACETATE

Eric Altherr, Chester; Ronald L. Hafer, Florham Park, and Richard L. Pepin, Verona, all of N.J., assignors to Sandoz, Inc., East Hanover, N.J.

Filed Sep. 27, 1979, Ser. No. 79,453

Int. Cl.³ C09B *67/00;* **D06P** *1/62*

U.S. Cl. 8—582 **7 Claims**

1. In a process wherein a fabric comprising cellulose triacetate is dyed with a disperse dye in an aqueous liquor containing a carrier for the dye, the improvement which comprises carrying out said dyeing in the presence of an aliphatic dicarboxylic acid diester of 6 to 24 carbon atoms as the carrier.

4,255,154

PROCESS FOR THE LEVEL DYEING OF POLYESTER MATERIAL

Jacques Zurbuchen, Kaiseraugst, and Paul Dussy, Basel, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation of Ser. No. 864,897, Dec. 27, 1977, abandoned. This application Jun. 18, 1979, Ser. No. 49,711

Int. Cl.³ D06P *1/00;* **C09B** *27/00*

U.S. Cl. 8—638 **8 Claims**

1. In a process for the level dyeing of polyester material by the exhaustion of three or more disperse dyes from an aqueous liquor at a temperature above 100° C., the improvement wherein all of the selected disperse dyes are migrating disperse dyes, having a diffusion coefficient Do at 130° C. of 2 to 10×10^{-10} cm^2/sec, a distribution coefficient K at 130° C. of 20 to 500 l/kg, and a migration half-life t/2 of less than 50 minutes.

4,255,155

PROCESS FOR AGGLOMERATING COAL

John H. Frankovich, Orland Park, Ill., assignor to Atlantic Richfield Company, Philadelphia, Pa.

Filed Dec. 20, 1978, Ser. No. 971,477

Int. Cl.³ C10L *9/00, 9/10*

U.S. Cl. 44—1 SR **9 Claims**

1. A method for reducing the amount of oil required to form coal-oil agglomerates comprising the steps of:

(a) combining a first coal fraction comprising predominately coarse coal particles, and a second coal fraction comprising predominately fine coal particles; the weighted size average of the coarse coal particles being more than four times the weighted size average of fine coal particles; the combined coal fraction having from about 60 to about 80 percent by weight coarse coal particles and from about 20 to about 40 percent by weight fine coal particles; and

(b) agitating a slurry of the combined coal fractions, hydrocarbon oil and water to form coal-oil agglomerates.

4. A process for beneficiating coal comprising the steps of:

(a) reducing coal size to form a first coal fraction of predominately coarse particle size, and a second coal fraction of predominately fine particle size; the weighted size average of the coarse coal particles being more than four times the weighted size average of fine coal particles;

(b) combining the first coal fraction comprising predominately coarse particles, and the second coal fraction comprising predominately fine coal particles; the combined coal fraction having from about 60 to about 80 percent by weight coarse coal particles and from about 20 to about 40 percent by weight fine coal particles;

(c) contacting an aqueous slurry of the combined coal particles of step (b) with a promoting amount of at least one conditioning agent capable of modifying or altering the existing surface characteristics of the pyrite under conditions to effectuate alteration or modification of at least a portion of the contained pyrite;

(d) contacting the slurry of coal particles with hydrocarbon oil to form coal oil agglomerates; and

(e) recovering coal-oil agglomerates wherein the coal exhibits reduced iron pyrite and mineral content.

4,255,156

PROCESS FOR REMOVAL OF SULFUR AND ASH FROM COAL

Jui-Yuan Sun, South Holland; Emmett H. Burk, Jr., Glenwood; Jin S. Yoo, Flossmoor, all of Ill., and George P. Masologites, Columbus, N.C., assignors to Atlantic Richfield Company, Philadelphia, Pa.

Filed Apr. 23, 1979, Ser. No. 32,301
Int. Cl.[3] C10L *9/00, 9/10*
U.S. Cl. 44—1 SR 29 Claims

1. A process for reducing the sulfur and ash content of coal comprising the steps of:

(a) providing a slurry in a hydrocarbon oil medium of coal particles containing ash and pyritic sulfur mineral matter;

(b) contacting the slurried coal particles with a promoting amount of at least one conditioning agent capable of modifying or altering the existing surface characteristics of the ash and pyritic sulfur mineral matter under conditions whereby there is effected modification or alteration of at least a portion of the contained ash and pyritic sulfur mineral matter;

(c) agglomerating the ash and pyritic sulfur mineral matter in said hydrocarbon oil slurry, while said surfaces are modified and altered, with water;

(d) separating the ash and pyritic sulfur mineral matter agglomerates from the hydrocarbon oil slurry; and

(e) recovering a hydrocarbon oil-coal slurry wherein the coal particles have a reduced sulfur and ash content.

7. The process of claim 1 wherein the conditioning agent is selected from the group consisting of metal aluminates having the formula $M'_d(AlO_3)_e$ or $M'_f(AlO_2)_g$, wherein M' is Fe, Co, Ni, An, Mg, Pb, Ca, Ba or Mo; and d, e, f and g are whole numbers dependent upon the ionic valence of M'.

9. The process of claim 1 wherein the conditioning agent is selected from the group consisting of alumino-silicates having the formula $Al_2O_3.SiO_2$ wherein x is a number within the range from about 0.5 to about 5.0.

12. The process of claim 1 wherein the conditioning agent is selected from the group consisting of inorganic cement materials capable of binding mineral matter.

4,255,157

THERMOGENIC COMPOSITIONS

Denjirou Yamaguchi; Noboru Mogi; Toshio Seta; Kunizo Oishi; Yoshihisa Fuzimori, and Atsushi Suzuki, all of Kyobashi, Japan, assignors to Toyo Ink Manufacturing Co., Ltd., Tokyo, Japan

Filed Sep. 18, 1979, Ser. No. 76,700
Claims priority, application Japan, Sep. 21, 1978, 53-116168
Int. Cl.[3] F24J *1/00, 3/00*
U.S. Cl. 44—3 C 7 Claims

1. A thermogenic composition capable of heat generation by contact with air or oxygen, which comprises:

(A) at least one component selected from the group consisting of alkali metal sulphides, polysulphides and hydrates thereof,

(B) at least one component selected from the group consisting of carbonaceous materials and

(C) at least one component selected from the group consisting of powdered iron, magnesium, aluminum and alloys of these metals.

3. A thermogenic composition according to claim 1 or 2, wherein the alkali metal is lithium, sodium, potassium, rubidium or cesium.

4,255,158

GASOLINE AND PETROLEUM FUEL SUPPLEMENTS

Samuel B. King, 2985 McGavock Pike, Nashville, Tenn. 35214

Continuation-in-part of Ser. No. 103.462, Dec. 14, 1979, which is a continuation-in-part of Ser. No. 85,339, Oct. 16, 1979. This application Mar. 28, 1980, Ser. No. 135,171
Int. Cl.[3] C10L *1/18*
U.S. Cl. 44—56 14 Claims

1. A fuel supplement consisting essentially of a lower alkanol selected from the group consisting of methyl alcohol, ethyl alcohol, n-propyl alcohol, i-propyl alcohol and mixtures thereof, and an alkali metal hydroxide selected from the group consisting of sodium hydroxide, potassium hydroxide, lithium hydroxide and mixtures thereof, wherein the ingredients are employed in the following relative proportions: 250 to 3,000 ml of the lower alkanol and 0.75 to 120 gr of the alkali metal hydroxide.

4,255,159

POLYMER COMBINATIONS USEFUL IN FUEL OIL TO IMPROVE COLD FLOW PROPERTIES

Harold N. Miller, Millington; Max J. Wisotsky, Highland Park, and Richard P. Rhodes, Westfield, all of N.J., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Continuation of Ser. No. 905,002, May 11, 1978, abandoned. This application Feb. 11, 1980, Ser. No. 120,682
Int. Cl.[3] C10L *1/16, 1/20*
U.S. Cl. 44—62 6 Claims

1. A fuel oil composition comprising a major proportion of a distillate petroleum fraction having an atmospheric boiling range of from about 120° C. to about 400° C. and from about 0.005 to 0.1 wt. % of a synergistic flow and filterability improving combination of the following:

(a) from 0.2 to 8 parts by weight of a polymeric substance selected from the group consisting of (i) poly (isomerized C_{12}–C_{50} alpha monoolefin) wherein said monoolefin contains at least 60% by weight of C_{16} to C_{32} alpha monoolefin, said poly (isomerized C_{12}–C_{50} alpha monoolefin) having a number average molecular weight of about 400 to 3000 and (ii) aromatics having 1 to 3 benzene rings alkylated with said poly (isomerized $C_{12\text{-}50}$ monoolefin); and

(b) per part by weight of a lubricating oil pour depressant having a number average moleuclar weight of about 800 to 50,000 and having pendant alkyl groups of 6 to 32 carbons atoms, said pour depressant being selected from the group consisting of (i) the condensation product of chlorinated $C_{16\text{-}40}$ paraffin containing about 5 to 25 wt. % chlorine and an aromatic hydrocarbon, and (ii) a sulfone copolymer of sulfur dioxide and $C_{14\text{-}20}$ alpha olefin, wherein said synergistic combinations are combinations selected from the group consisting of (a) (i) with (b) (ii); (a) (ii) with (b) (i); and (a) (ii) with (b) (ii).

4,255,160

FLOW IMPROVER FOR HEAVY PETROLEUM PRODUCTS COMPRISING ALKENYL SUCCINATE DIESTER

Peter G. Pappas, Downers Grove, and Adel B. Abdul-Malek, Naperville, both of Ill., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Filed Mar. 9, 1979, Ser. No. 18,995
Int. Cl.[3] C10L *1/18*
U.S. Cl. 44—70 8 Claims

1. A composition having improved low-temperature flowability comprising a heavy petroleum product containing a fraction having a boiling range greater than about 343° C. (650° F.) and a low-temperature flow improving amount of a linear primary monohydric alcohol diester of a linear primary alpha olefin substituted succinic acid compound.

4,255,161

APPARATUS FOR INTRODUCING SOLID FUELS INTO A PRESSURE GASIFICATION REACTOR

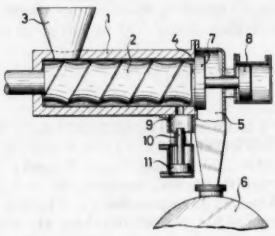
Albert Grimminger, Leonberg; Jürgen Strecker; Werner Wiedmann, both of Stuttgart, and Peter Wenning, Gelsenkirchen-Buer, all of Fed. Rep. of Germany, assignors to Werner & Pfleiderer, Stuttgart and Veba Oel AG, Gelsenkirchen-Buer, both of, Fed. Rep. of Germany

Filed Nov. 9, 1979, Ser. No. 92,737

Claims priority, application Fed. Rep. of Germany, Nov. 18, 1978, 2850121

Int. Cl.[3] C10J *3/50*

U.S. Cl. 48—86 R 11 Claims



1. Apparatus for the gasification of solid fuel comprising a gasification reactor, a housing, means for supplying finely divided fuel into said housing, a conveyor worm rotatably mounted in said housing in tight-fitting relation therein to advance the fuel through the housing while compacting the same to form a gas-tight plug, said housing having a discharge opening in communication with the reactor and through which the plug is fed for supply to the reactor, closure means for selectively opening and closing said discharge opening, said housing being provided with an outlet opening in proximity to said discharge opening, said outlet opening being open to the ambient atmosphere, and further closure means for selectively opening and closing said outlet opening, said closure means and said further closure means being operatively coupled so that when one is operated to close the associated opening the other is operated to open the associated opening.

4,255,162

INTEGRATED PROCESS FOR CONVERTING SULFUR-CONTAINING FUELS TO LOW SULFUR COMBUSTIBLE GAS

Gerald Moss, Wantage, England, assignor to Exxon Research and Engineering Co., Florham Park, N.J.

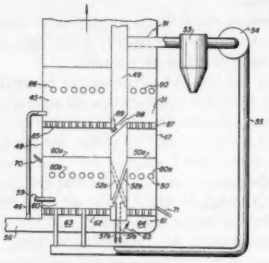
Continuation-in-part of Ser. No. 962,224, Nov. 20, 1978, abandoned, which is a continuation of Ser. No. 505,365, Sep. 12, 1974, abandoned, which is a continuation of Ser. No. 249,713, May 1, 1972, abandoned, which is a continuation of Ser. No. 734,816, Jun. 5, 1968, abandoned. This application Jul. 27, 1979, Ser. No. 61,368

Claims priority, application United Kingdom, Jun. 7, 1967, 38447/66; Feb. 27, 1968, 9533/68

Int. Cl.[3] C10K *3/54*

U.S. Cl. 48—197 R 9 Claims

1. An integrated process for converting a sulfur-containing fuel to a substantially sulfur-free combustible gas in which the fuel is partially combusted within a sulfur-fixing dense-phase fluidized fuel conversion bed operated at a fuel conversion temperature so that the fuel is converted to a substantially sulfur-free combustible gas which is discharged from above the top of the conversion bed and wherein sulfur from the fuel is fixed, by chemical reaction in particles of the conversion bed, and in which particles are transferred from a first region of the conversion bed to a first region of a dense phase fluidized regeneration bed operated at regeneration conditions including a regulated regeneration temperature exceeding the fuel conversion temperature so that at least some of the sulfur which is chemically fixed in the particles is released as gas phase sulfur moieties which are discharged from above the top of the said regeneration bed, and transferring particles from a second region of the regeneration bed, spaced-apart from the first region thereof, to a second region of the fuel conversion bed spaced apart from the first region thereof, wherein the conversion bed is comprised of particles including alkaline earth metal oxide which fixes sulfur from the fuel by forming alkaline earth metal sulfide, and the conversion bed is fluidized by passing into the bottom thereof an oxygen containing gas, and wherein the regeneration bed is fluidized by passing into the bottom thereof an oxygen containing gas whereby at least some alkaline earth metal sulfide from the fuel conversion bed is converted to alkaline earth metal oxide with the evolution of sulfur oxide(s) and the liberation of heat tending to raise the temperature of the regeneration bed towards a deactivating temperature range, regulating the rate of transfer of particles from the fuel conversion bed at the conversion bed temperature to the regeneration bed so as to effect at least partial regulation of the



temperature in the regeneration bed in a range not exceeding a predetermined maximum regeneration bed temperature below the said deactivating temperature range, regulating the rate of supply of oxygen-containing gas to the regeneration bed to be such that:

(a) sulfur is liberated therefrom as sulfur moieties, including sulfur oxide(s) at substantially the same rate as sulfur from the fuel is fixed in the fuel conversion bed; but

(b) insufficient to reduce the temperature of the regeneration bed to that of the

fuel conversion bed; and employing the heat content of the particles transferred from the second region of the regeneration bed to the second region of the fuel conversion bed to provide some of the heat required for maintaining the conversion temperature of the fuel conversion bed whereby a reduced amount of fuel is required to maintain the temperature of the fuel conversion bed and an increased proportion of the fuel is converted to substantially sulfur-free combustible gases.

4,255,163

BALANCING DEVICE

Hans C. Sonderegger, Neftenbach, and Urs B. Meyer, Niederglatt, both of Switzerland, assignors to Kistler Instrumente AG, Switzerland

Filed Sep. 29, 1978, Ser. No. 946,870

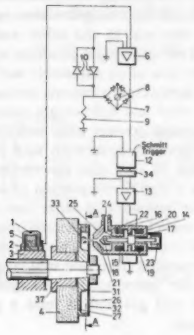
Claims priority, application Switzerland, Sep. 29, 1977, 11878/77

Int. Cl.[3] B24B *41/04, 45/00*

U.S. Cl. 51—169 18 Claims

1. A device for balancing rotating bodies comprising sensor means responsive to the out of balance of the rotating body for generating a control signal of approximately rectangular pulse shape, an electromagnetic transducer means responsive to the control pulse signal for being operated at a frequency in accordance with the speed of the rotating body, a spray valve combined with the electromagnetic transducer means to form a

single spray unit, and at least one spray disk being mounted on the rotating body to be balanced, the spray disk having at least three chambers, means for supplying a spray medium to the single spray unit, the single spray unit having a first nozzle operable to selectively spray the spray medium into any one of



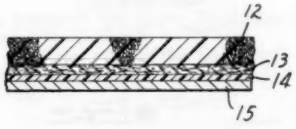
the at least three chambers of the spray disk, the single spray unit injecting the spray medium into at least one chamber of the at least three chambers in response to the control pulse signal with correct phasing during the normal revolutions of the rotating body until the amount of spray medium injected compensates for the out of balance of the rotating body.

4,255,164

FINING SHEET AND METHOD OF MAKING AND USING THE SAME

Hilbert C. Butzke, North Hudson, Wis., and Dennis W. Harry, Mahtomedi, Minn., assignors to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.

Continuation-in-part of Ser. No. 980,926, May 24, 1978, abandoned. This application Apr. 30, 1979, Ser. No. 33,867
Int. Cl.³ B24D *11/02;* B24B *1/00*
U.S. Cl. 51—295 **6 Claims**



1. A fining sheet being capable of generating a fining slurry when subjected to an aqueous flow, pressure, and movement against vitreous stock being fined, comprising a flexible, conformable backing sheet covered on one side thereof with a microcellular layer having a weight of at least 450 g. per m^2 and a thickness of at least 10 mils said layer being comprised of

(a) a cured modified resinous binder material having a Knoop hardness value in the range of 15 to 50 and being selected from a group consisting of urea formaldehyde and phenol formaldehyde modified with about 1% to about 40% by weight of a thermoplastic polymeric modifier selected from the group consisting of polyamide, polyacrylate, polyacrylonitrile, polyvinyl ester, polyvinyl alcohol, and copolymers comprising said thermoplastic polymeric modifiers and combinations thereof; and

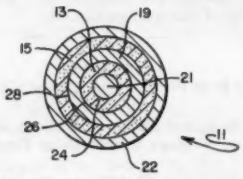
(b) abrasive fining granules having a Knoop hardness of at least about 1000 and an average particle size of about 15 to 60 microns to provide a volume ratio of abrasive granules to binder in the range of about 0.75:1 to 1.75:1.

4,255,165

COMPOSITE COMPACT OF INTERLEAVED POLYCRYSTALLINE PARTICLES AND CEMENTED CARBIDE MASSES

Mahlon D. Dennis, Columbus, and Paul D. Gigl, Worthington, both of Ohio, assignors to General Electric Company, Worthington, Ohio

Filed Dec. 22, 1978, Ser. No. 972,345
Int. Cl.³ B24D *3/06*
U.S. Cl. 51—309 **4 Claims**



1. In a composite compact which is comprised of:

(a) a layer of polycrystalline material comprising abrasive particles selected from diamond, cubic boron nitride, wurtzite boron nitride, and mixtures thereof, bonded together in a self-bonded relationship; and

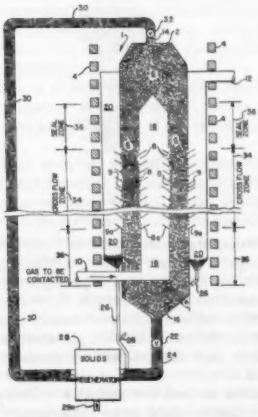
(b) A cemented carbide mass bonded to one surface of the polycrystalline layer; the improvement which comprises a compact having at least two cemented carbide masses bonded to and interleaved with at least two masses of the polycrystalline material.

4,255,166

PROCESS FOR THE REMOVAL OF PARTICULATES ENTRAINED IN A FLUID USING A MAGNETICALLY STABILIZED FLUID CROSS-FLOW CONTACTOR

Martin O. Gernand; Francis X. Mayer, both of Baton Rouge, La., and Vincent Siminski, Rockaway, N.J., assignors to Exxon Research and Engineering Company, Florham Park, N.J.

Filed Jul. 31, 1979, Ser. No. 62,540
Int. Cl.³ B03C *1/00*
U.S. Cl. 55—3 **11 Claims**



1. A process for the removal of particulates entrained in a fluid, said process comprising the steps:

(a) continuously introducing and removing a bed comprising

a particulates capture medium through at least one porous chamber in a descending manner or direction, said bed comprising a particulates capture medium comprises a plurality of solid, discrete magnetizable particles;

(b) structuring and controlling the porosity in said bed by applying a magnetic field to said bed in a manner such that the magnetic field is substantially colinear with the external force field within said chamber;

(c) passing a gas containing entrained particulates through said descending bed of particulate capture medium in a manner such that it has a velocity component substantially perpendicular to the external force field and the applied magnetic field within said chamber and withdrawing a gaseous stream substantially free of entrained particulates.

4,255,167

PROCESS FOR PURIFYING CYANOGEN CHLORIDE GAS

Robert M. Babb, and Melvin J. Guillory, Jr., both of Baton Rouge, La., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Nov. 17, 1978, Ser. No. 961,794
Int. Cl.³ B01D *53/14*
U.S. Cl. 55—71 **5 Claims**

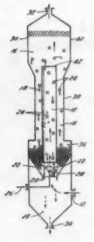
1. A process for purifying raw cyanogen chloride gas contaminated with chlorine which comprises fractionally separating chlorine from cyanogen chloride and thereafter absorbing essentially chlorine-free cyanogen chloride in a solvent which is fed to the bottom of the fractionation column and which has a higher boiling point than cyanogen chloride; the cyanogen chloride absorption and dissolution in the solvent being accomplished simultaneously in the lower portion of a stripping section, with the reboiling solvent providing vapors necessary for stripping the chlorine from the cyanogen chloride in the upper portion of the stripping section.

4,255,168

TURBULENT TRANSPORT CONTACTOR AND METHOD OF OPERATION

Xuan T. Nguyen, Roxboro, Canada, assignor to Domtar Inc., Montreal, Canada

Filed Aug. 6, 1979, Ser. No. 64,090
Int. Cl.³ B01D *47/06;* B01F *304*
U.S. Cl. 55—85 **15 Claims**



1. A turbulent transport contacter comprising; means defining an elongated contact section; a plurality of lightweight elements, means defining a passage adjustable in size to controllably introduce said lightweight elements directly into said contact section adjacent one end thereof; means to project a liquid directly onto said lightweight elements and introduce said liquid to said contact section; means to introduce gas flowing in a direction axially of said contact section into said contact section at said one end at a velocity to entrain said lightweight elements and carry them beyond the end of said section remote from said one end; means to de-entrain said lightweight elements and a significant portion of said liquid from said gas positioned beyond said end of said section remote from said one end; and means to return said lightweight elements to said passage for re-introduction thereof into said section.

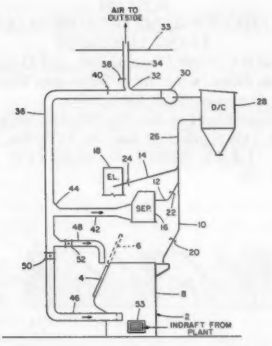
10. A method of intimately contacting a gas and liquid comprising; injecting lightweight elements into an elongated tubular passage forming a contact zone adjacent one end thereof, introducing a gas flowing substantially axially of said passage into said passage and and passing said gas through said zone at a velocity to entrain said lightweight elements and carry said elements from said one end to the other end of said zone, adjusting the amount of lightweight elements injected into said zone by adjusting the size of an adjustable size passage means for introducing said lightweight elements into said zone, applying a liquid directly onto said lightweight elements and introducing said liquid to said contact zone and transporting said liquid through said contact zone with said lightweight elements by entrainment in said gas; de-entraining said lightweight elements and a significant portion of said liquid from said gas at a position beyond said other end of said contact zone in the path of travel of said gas and re-circulating said lightweight elements together with a portion of said liquid via a separate passage separated from said tubular passage back to said passage means for introduction into said contact zone; separately removing said gas and at least a portion of said liquid from said system.

4,255,169

METHOD OF CONSERVATION IN PROCESSING INDUSTRIAL AIR

Raymond M. Leliaert, South Bend; Robert N. Lindner, Granger, and James K. Davidson, Mishawaka, all of Ind., assignors to Wheelabrator-Frye Inc., Hampton, N.H.

Filed Jun. 22, 1979, Ser. No. 51,210
Int. Cl.³ B01D *46/42;* B24B *55/06;* F24F *3/16;* B27G *19/00*
U.S. Cl. 55—97 **3 Claims**



1. A method of conserving energy invested in processed air contaminated with dust or dirt generated within a cabinet having a door and doorway for access to the interior of the cabinet comprising the steps of:

(a) exhausting the contaminated air from the cabinet to a dust collecting means;

(b) removing a substantial part of the contaminating dust or dirt fron the contaminated air to provide a cleansed air by processing the contaminated air through dust collecting means;

(c) venting a relatively small portion of the cleansed air to the atmosphere;

(d) returning a substantial portion of the cleansed air to the cabinet when the door is closed;

(e) returning a substantial portion of the cleansed air to the doorway when the door is open; and

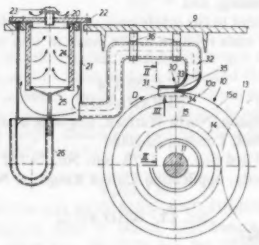
(f) introducing an amount of air from the atmosphere adjacent the cabinet into the cabinet corresponding to the amount vented into the atmosphere.

4,255,170

VENTING DEVICE FOR THE HOUSING OF A ROTARY MACHINE

Georg Wahl, Crailsheim, Fed. Rep. of Germany, assignor to Voith Turbo GmbH & Co. KG, Crailsheim, Fed. Rep. of Germany

Filed Jun. 8, 1979, Ser. No. 46,662
Claims priority, application Fed. Rep. of Germany, Sep. 2, 1978, 2838395
Int. Cl.[3] B01D *35/04*
U.S. Cl. 55—185 12 Claims



1. A venting device for venting the housing of a rotary machine, wherein:

said machine includes a housing; a rotating part in said housing; said rotating part including a rotating surface thereof which is on the outside of said rotating part in said housing;

said venting device comprising:

venting duct means leading from inside said housing to outside thereof;

a liquid-mist separator located in said duct means for removing liquid-mist from air passing through said separator;

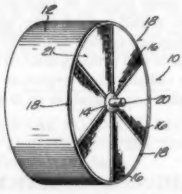
a peeling device placed and shaped for removing the boundary layer of mist-laden air which is rotating along with said rotating surface; said peeling device serving as an inlet to said venting duct means, whereby the kinetic energy of the boundary layer of mist laden air peeled off by said peeling device drives the mist laden air through said duct means and through said liquid-mist separator.

4,255,171

HEAT TRANSFER MEDIUM FOR ROTARY HEAT TRANSFERRERS

Konstantins Dravnieks, Thiensville, Wis., assignor to Wehr Corporation, Milwaukee, Wis.

Filed Aug. 17, 1978, Ser. No. 934,463
Int. Cl.[3] B01D *53/08, 53/26;* B32B *3/28*
U.S. Cl. 55—269 16 Claims



12. A rotatable heat exchanger wheel comprising a cylindrical, open-ended casing supported for rotation,

a plurality of wedge-shaped segments of heat exchange medium disposed in and carried by said casing, said heat exchange medium comprising

alternate planar and corrugated layers of a thin, fiber-reinforced, heat-curable, organic resinous material containing at least 50 weight % of the organic resin and bonded together at their points of contact to form a self-supporting, water-proof structure including uniformly-spaced, tubular flow passages extending axially from one side of the structure to the other in parallel relationship to each other and parallel to the rotational axis of said casing, the portions of said structure defining said flow passages being substantially non-absorbent relative to water, said fiber-reinforced, resinous material comprising sheets of a fibrous material substantially saturated with a phenolic or a melamine resin; and

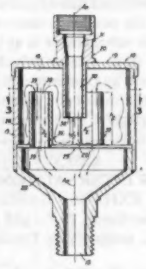
a film coating the surface of said flow passages exposed to air flow, said film being applied as an aqueous coating solution containing about 15–20 weight % of lithium chloride and a sufficient amount of a water-soluble, wetting agent to provide a continuous film of said solution on said surfaces.

4,255,172

JET IMPACTION PRESEPARATOR

Michael L. Smith, Atlanta, Ga., assignor to Andersen Samplers Inc., Atlanta, Ga.

Continuation-in-part of Ser. No. 10,391, Feb. 8, 1979, abandoned, and Ser. No. 13,401, Feb. 21, 1979. This application Nov. 14, 1979, Ser. No. 94,291
Int. Cl.[3] B01D *53/30*
U.S. Cl. 55—270 10 Claims



1. A preseparator for connection to the sampling inlet of a particle sizing sampler so that a gaseous medium is forced first through the preseparator to preseparate those particles from the gaseous medium above the particle diameter acceptance range of the particle sizing sampler and then through the particle sizing sampler to separate those particles within the diameter acceptance range of the sampler from the gaseous medium according to size including:

a housing defining a preseparating chamber therein about a preimpaction central axis having an outlet therefrom connected to the sampling inlet of the particle sizing sampler;

an impaction plate mounted in said preseparating chamber and dividing said chamber into an impaction subchamber and a discharge subchamber, said outlet communicating with said discharge subchamber and the sampling inlet to the particle sizing sampler;

preimpaction nozzle means oriented generally normal to said impaction plate and defining at least one preimpaction jet passage therethrough having a nozzle inlet communicating with the gaseous medium to be sampled and a nozzle outlet communicating with said impaction subchamber, said nozzle outlet sized and located with respect to said impaction plate to cause those particles in the gaseous medium with effective particle diameters above the particle diameter acceptance range of the particle sizing sampler to be separated by jet impaction on said impaction plate within said impaction subchamber; and

exit tube means defining at least one exit passage therethrough connecting said impaction subchamber with said

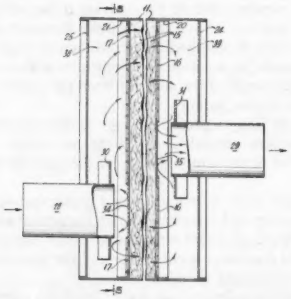
discharge subchamber so that the gaseous medium passes from said impaction subchamber into said discharge subchamber through said exit passage, said exit passage having a passage inlet located in said impaction subchamber and spaced from said impaction plate a distance greater than the distance between said nozzle outlet of said preimpaction nozzle means and said impaction plate, the relative sizes of said nozzle outlet from said preimpaction jet passage and said impaction subchamber selected so that the velocity of the gaseous medium passing through said impaction subchamber is no greater than one-tenth of the velocity of the gaseous medium passing through said nozzle outlet from said preimpaction jet passage to permit the particles that bounce from said impaction plate upon impaction to be collected out of the gaseous medium within said impaction subchamber, the relative cross-sectional sizes of said passage inlet to said exit passage and said nozzle outlet from said preimpaction jet passage selected so that the velocity of the gaseous medium through said passage inlet to said exit passage is no greater than one-half of the velocity of the gaseous medium passing through said nozzle outlet from said preimpaction jet passage to prevent the motion of the gaseous medium flowing from said impaction subchamber into said passage inlet of said exit passage from dislodging and re-entraining particles which have already been separated in said impaction subchamber, and the distance between said passage inlet to said exit passage and said impaction plate together with the cross-sectional size of said impaction subchamber selected so that the residence time of the gaseous medium in said impaction subchamber is at least 0.2 second at the volumetric gas flow rate at which the preseparator is operated, to permit agglomerated particles dislodged after separation to settle out of the gaseous medium as it flows through said impaction subchamber.

4,255,173

LEAD FILTER FOR INTERNAL COMBUSTION ENGINE EXHAUST GASES

Edward A. Mayer, Newburgh, N.Y., and John T. Brandenburg, Port Neches, Tex., assignors to Texaco Inc., White Plains, N.Y.

Filed Dec. 27, 1977, Ser. No. 865,106
Int. Cl.³ B01D *50/00*; F01N *3/02*
U.S. Cl. 55—329 **1 Claim**



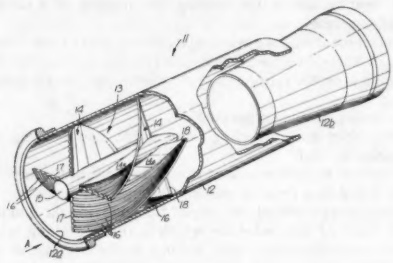
1. Automobile type lead filter, comprising in combination
an elongated housing having an oval cross section shape and containing a mass of alumina coated steel wool centrally located therein,
a pair of open mesh supports extending transversely across the interior of said housing at the ends of said mass for holding it in place,
angle means centrally located longitudinally for stiffening said housing to maintain said oval cross section,
an inlet pipe located at one end of said housing with the axis thereof offset from the longitudinal axis of the housing,
an outlet pipe located at the other end of said housing with the axis thereof aligned with the longitudinal axis of the housing,
a pair of impervious baffles integrally attached to said mesh supports and each being aligned with one of said inlet and outlet pipes,
said baffles being spaced from the inside ends of said pipes to minimize pressure drops thereat,
impervious material end walls on said housing forming a pair of plenums one at each end of said housing between said mesh supports and the end walls,
said inlet and outlet pipes extending through said end walls of the housing, and
means adjacent to the inside ends of said pipes for supporting the inner ends relative to the walls of said housing.

4,255,174

SEPARATOR

Trevor W. Simpson, North Watford, England, assignor to Rolls-Royce Limited, London, England

Filed Sep. 27, 1979, Ser. No. 79,257
Claims priority, application United Kingdom, Nov. 28, 1978, 46429/78
Int. Cl.³ B01D *45/12*
U.S. Cl. 55—347 **10 Claims**



1. A separator suitable for separating liquid droplets from a liquid droplet carrying gas stream comprising: a substantially circular cross-sectional primary duct; and vaned means positioned within said primary duct for causing any liquid droplet carrying gas stream passing in operation through said primary duct into a vortex about the axis of said primary duct, said vaned means including at least one vane upon which at least some of said liquid droplets of said liquid droplet carrying gas stream impinge and coalesce, said at least one vane having a leading edge and a trailing edge with respect to said gas stream passing through said primary duct, said at least one vane additionally having a liquid droplet and coalesced liquid directing means on at least one surface thereof interconnecting at least a radially inner region of said leading edge with a radially outer region of said trailing edge, said directing means causing liquid droplets and coalesce liquid to be directed to said radially outer region of said primary duct so that the gas stream exhausted from the radially inner region of said primary duct has a reduced droplet concentration or is substantially liquid droplet free.

4,255,175

GAS SEPARATION FILTER DEVICE HAVING A HANDLE

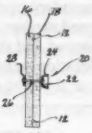
O. DuWayne Wilkins, Shepherdsville, Ky., assignor to American Air Filter Company, Inc., Louisville, Ky.

Filed Oct. 12, 1979, Ser. No. 84,462
Int. Cl.³ B01D *46/10*
U.S. Cl. 55—357 **2 Claims**

1. A gas separation filter device for separating particulate from a gas stream passing through the filter device, of the type having a flow-through frame, a sheet of gas separation filter media disposed across the flow-through frame and attached to

the flow-through frame, keeper means located on one side of the sheet of gas separation filter media, handle means located on the other side of the sheet of gas separation filter media from the keeper means, wherein the improvement comprises:

a flexible cord extending through the sheet of gas separation



filter media, the flexible cord being longer than the sheet of gas separation filter media is thick, and the flexible cord being attached at one of its ends to the keeper means and attached at the other of its ends to the handle means such that said keeper means and said handle means are spaced from said filter media.

4,255,176

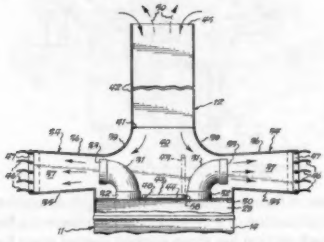
COMBINED AIR PURIFIER AND DESTRATIFIER

Lawrence Macrow, 2330 W. Blood, East Aurora, N.Y. 14052

Filed Aug. 20, 1979, Ser. No. 67,607

Int. Cl.³ B01D *50/00;* **F24F** *3/16, 13/00*

U.S. Cl. 55—415 **3 Claims**



1. A combined unit for purifying and destratifying air comprising a first air inlet in a first area for receiving air to be purified, air purifying means for receiving air from said first inlet and removing foreign matter from said air, a second air inlet at a higher level than said first air inlet for receiving air to be destratified, fan means for moving air through said first air inlet and through said air purifying means, air outlet means including nozzle means for discharging said air received by said unit from said first inlet, venturi means for receiving air discharged from said nozzle means, and duct means for effecting communication between said second air inlet and said venturi means to thereby cause said air being discharged from said nozzle means to draw air through said duct means from said second inlet and cause said air from said second inlet to be discharged through said outlet means along with said air from said first inlet.

4,255,177

GLASSWARE FORMING MACHINES

Frank A. Fenton, Doncaster, England, assignor to Emhart Industries, Inc., Farmington, Conn.

Filed Mar. 28, 1979, Ser. No. 24,647

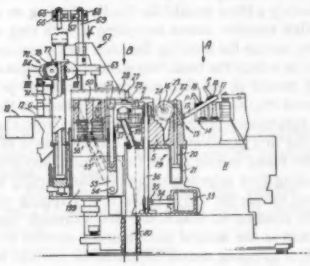
Claims priority, application United Kingdom, Apr. 10, 1978, 13972/78

Int. Cl.³ C03B *9/93*

U.S. Cl. 65—79 **8 Claims**

1. A process of forming glassware from a gob of molten glass in an individual section of a multiple section glassware forming machine, which section has three stations spaced apart longitudinally of the section, wherein a primary cycle comprising the machine functions for forming a parison in an inverted position from the gob of molten glass is performed in the first of said stations, a secondary cycle comprising the machine functions for forming an article of glassware in a blow mould is performed at the third of said stations, the parison is moved from the first station to the second station in a first time by a first transfer means which presents the parison in an upright position at the second station, the parison is moved from the second station to the third station by a second transfer means in a second time, the article of glassware is removed from the third station to a take-out position beyond the third station by a third transfer means in a third time, whereby the period elapsing between the time at which the first transfer means presents the parison to the second station and the time at which the second transfer means moves the parison from the second station to the third station is adjustable without altering the relative timing of any of the machine functions comprised within either the primary cycle or the secondary cycle, and wherein each of the parison, the further formed parison, and the article of glassware is moved by the first; second and third transfer means, respectively, at rates of acceleration suitable for the condition of the glass contained therein at the time of movement.

3. An individual section of a multiple section glassware forming machine which comprises three operating stations which are, respectively, a first station including a blank mould for forming a parison in an inverted position from a gob of molten glass delivered to the blank mould, a second station in which reheating of a parison takes place, and a third station including a blow mould for finally shaping an article of glass-



ware, first transfer means including a neck ring structure and actuating means for moving the neck ring structure from a first position in which the neck ring structure engages a parison in an inverted position in the blank mould at the first station to a second position in which the neck ring structure presents the parison in an upright position for release at the second station and returning the neck ring structure from the second position to the first position prior to the formation of another parison in the blank mould at the first station, second transfer means including first gripping means for supporting a parison and actuating means for moving the first gripping means between a first position in which the first gripping means supports a parison at the second station, and a second position in which the first gripping means supports the parison in such a location at the third station that the blow mould at the third station can close around the parison, and a third transfer means including second gripping means and actuating means for moving the second gripping means between a first position in which the second gripping means engages an article of glassware at the third station, and a second position in which the second gripping means holds the article of glassware at a takeout position, the actuating means of each of the first, second and third transfer means being operable independently of the other two actuating means, whereby each of the neck ring structure, the first gripping means and the second gripping means is movable between its first and second positions at times and rates of acceleration independent of the times of movement and rates of acceleration of the other transfer means.

4,255,178

GLASSWARE FORMING MACHINES

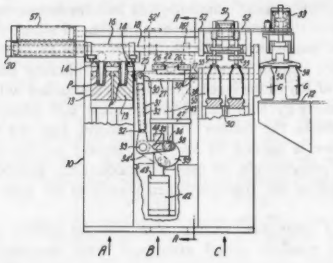
David Braithwaite, Doncaster, England, assignor to Emhart Industries, Inc., Farmington, Conn.

Filed Mar. 28, 1979, Ser. No. 24,826

Claims priority, application United Kingdom, Apr. 10, 1978, 13973/78

Int. Cl.³ C03B 9/193

U.S. Cl. 65—79 13 Claims



1. An individual section of a multiple section glassware forming machine which comprises three operating stations which are, respectively, a first station including an upright top-opening blank mould for forming a parison, a second station in which reheating of a parison takes place, and a third station including a blow mould for finally shaping an article of glassware, first transfer means including a neck ring structure and actuating means for moving the neck ring structure from a first position in which the neck ring structure engages a parison in the blank mould at the first station to a second position in which the neck ring structure releases the parison at the second station and returning the neck ring structure from the second position to the first position prior to the formation of another parison in the blank mould at the first station, second transfer means including first gripping means for supporting a parison and actuating means for moving the first gripping means between a first position in which the first gripping means supports a parison at the second station and a second position in which the first gripping means supports the parison in such a location at the third station that the blow mould at the third station can close around the parison, and a third transfer means including second gripping means and actuating means for moving the second gripping means between a first position in which the second gripping means engages an article of glassware at the third station and a second position in which the second gripping means holds the article of glassware at a takeout position beyond the third station, the actuating means of each of the first, second and third transfer means being operable independently of the other two actuating means whereby each of the neck ring structure, the first gripping means and the second gripping means is movable between its first and second positions at times independent of the times of corresponding movement of the other two of the said neck ring structure, the first gripping means and the second gripping means.

12. A process of forming an article of glassware from a gob of molten glass in an individual section of a multiple section glassware forming machine, which section has three stations spaced apart longitudinally of the section, wherein a primary cycle comprising the machine functions for forming a parison from the gob of molten glass is performed in the first of said stations, a secondary cycle comprising the machine functions for forming an article of glassware in a blow mould is performed at the third of said stations, the parison is moved from the first station to the second station by a first transfer means in a first time, the parison is moved from the second station to the third station by a second transfer means in a second time, and the article of glassware is removed from the third station by a third transfer means in a third time and is supported by the third transfer means over a takeout position, whereby the period elapsing between the time at which the first transfer means brings the parison to the second station and the time at which the second transfer means moves the parison from the second station is adjustable without altering the relative timing of any of the machine functions comprised within either the primary cycle or the secondary cycle, and wherein each of the parison, the further formed parison and the article of glassware is moved by the first, second and third transfer means, respectively, at a rate of acceleration suitable for the condition of the glass contained therein at the time of movement.

4,255,179

GLASSWARE FORMING MACHINES

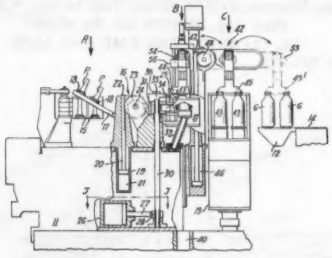
Thomas V. Foster, Doncaster, England, assignor to Emhart Industries, Inc., Farmington, Conn.

Filed Mar. 28, 1979, Ser. No. 24,646

Claims priority, application United Kingdom, Apr. 10, 1978, 13974/78

Int. Cl.³ C03B 9/193

U.S. Cl. 65—79 23 Claims



1. A process of forming glassware from a gob of molten glass in an individual section of a multiple section glassware forming machine, which section has three stations spaced apart longitudinally of the section, wherein a primary cycle comprising the machine functions for forming a parison from the gob of molten glass is performed in the first of said stations, a secondary cycle comprising the machine functions for finally shaping an article of glassware in a blow mold is performed at the third of said stations, the parison is moved from the station to the second station by a first transfer means, the first transfer means releases the parison at the second station and the transfer means returns to the first station prior to the time the next parison is formed at the first station, the parison is subsequently moved from the second station to the third station by a second transfer means operable independently of the first transfer means, and the period elapsing between the time at which the first transfer means brings the parison to the second station and the time at which the second transfer means removes the parison from the second station to the third station is adjustable, thereby enabling the time during which the parison reheats after its formation in the primary cycle and before the formation of the article of glassware in the secondary cycle to be adjusted without altering the relative timing of any of the machine functions comprising the primary cycle or the relative timing of any of the machine functions comprising the secondary cycle.

5. An individual section of a multiple section glassware forming machine which comprises three operating stations spaced apart longitudinally of the section and which are, respectively, a first station including a blank mold for forming a parison, a second station in which reheating of a parison takes place, and a third station including a blow mold for finally shaping an article of glassware, and independently operable first and second transfer means, the first transfer means including a neck ring structure and actuatig means for moving the

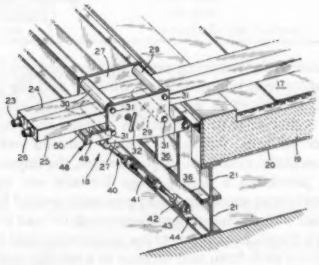
neck ring structure from a first position in which the neck ring structure engages a parison in the blank mold at the first station to a second position in which the neck ring structure releases a parison at the second station and returning the neck ring structure from the second position to the first position prior to the formation of the next parison in the blank mold at the first station, and the second transfer means including gripping means and actuating means for moving the gripping means between a first positon in which the gripping means engaging a parison at the second station and a second position in which the gripping means holds the parison in such a location at the third station that the blow mold at the third station can close around the parison.

4,255,180

SUPPORT MECHANISM FOR HEAT EXCHANGERS IN FLOAT GLASS APPARATUS

Everett G. Wolfe, Manteca, Calif., assignor to Libbey-Owens-Ford Company, Toledo, Ohio

Filed Sep. 14, 1979, Ser. No. 75,752
Int. Cl.³ C03B *18/18*
U.S. Cl. 65—182.1 **8 Claims**



1. In apparatus for the manufacture of flat glass by the float process including a bath of molten metal continued within an elongated tank structure having opposite sides, and a heat exchanger extending transversely above the ribbon of glass as it advances across the molten metal bath between said opposite sides, the improvement comprising a support carriage affixed to the tank structure along the side thereof through which said heat exchanger extends, said support carriage including inner and outer pairs of spaced, vertically aligned, rotatable rollers located closely adjacent said side, the rollers of each said pair being spaced apart a distance slightly greater than the depth of said heat exchanger so that their peripheral surfaces engage the top and bottom surfaces of said heat exchanger whereby said exchanger is contilevered over said ribbon.

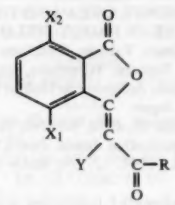
4,255,181

USE OF SUBSTITUTED-3-PHENACYLIDENEPHTHALIDES AS CORN PLANT GROWTH REGULANTS

John A. Houbion, Kirkwood, and Miguel W. Dayawon, Des Peres, both of Mo., assignors to Monsanto Company, St. Louis, Mo.

Filed Sep. 4, 1979, Ser. No. 71,919
Int. Cl.³ A01N *43/12*
U.S. Cl. 71—88 **5 Claims**

1. A method for inhibiting the male reproductive component of a corn plant which comprises applying to said corn plant before or during the early stages of reproductive differentiation an effective, non-lethal amount of a compound having the formula



wherein R is selected from the group consisting of naphthyl, phenyl and substituted phenyl containing from 1 to 2 substituents selected from the class consisting of lower alkyl, lower alkoxy, halogen, trifluoromethyl and nitro; X_1 and X_2 are independently selected from the group consisting of hydrogen, halogen and lower alkoxy; and Y is selected from the group consisting of hydrogen, chlorine and bromine; provided that R is not 4-nitrophenyl and further provided that when X_1 is lower alkoxy, R is not 2,5-dimethoxyphenyl.

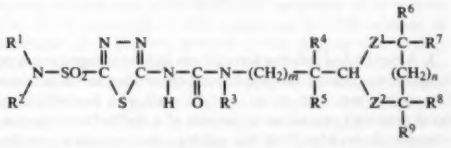
4,255,182

AMINOSULFONYLTHIADIAZOLYLUREAS

John Krenzer, Oak Park, Ill., assignor to Velsicol Chemical Corporation, Chicago, Ill.

Filed Mar. 10, 1980, Ser. No. 128,774
Int. Cl.³ A01N *47/36*; C07D *405/12, 405/14*
U.S. Cl. 71—90 **10 Claims**

1. A compound of the formula



wherein R^1 is lower alkyl, R^2 is selected from the group consisting of hydrogen and lower alkyl; or R^1 and R^2 together with the nitrogen atom form a cyclic ring structure having 4 or 5 carbon atoms and one nitrogen atom; m is the integer 0 or 1; when m is 1, R^4 and R^5 are each independently selected from the group consisting of hydrogen and lower alkyl of up to 3 carbon atoms; when m is 0, R^4 is hydrogen and R^5 is the same as defined above, R^3, R^6, R^7, R^8, R^9 are each independently selected from the group consisting of hydrogen and lower alkyl; n is an integer from 0 to 2; and Z^1 and Z^2 are each independently selected from the group consisting of oxygen and sulfur.

9. A herbicidal composition comprising an inert carrier and, as an essential active ingredient, in a quantity toxic to weeds, a compound of claim **1**.

10. A method of controlling weeds which comprises contacting said weeds with a herbicidal composition comprising an inert carrier and, as the essential active ingredient, in a quantity toxic to weeds, a compound of claim **1**.

4,255,183

SUBSTITUTED PHENYL UREA AND HERBICIDES FOR USE IN PADDY FIELD

Hiroshi Ohyama; Sanae Takada; Yoshihisa Watanabe, all of Atsugi; Jyotaroh Tamura, Hiratsuka, and Iwao Taketomi, Hatano, all of Japan, assignors to Hokko Chemical Industry Co., Ltd., Tokyo, Japan

Filed Jun. 15, 1978, Ser. No. 916,361
Claims priority, application Japan, Jun. 17, 1977, 52/70990
Int. Cl.[3] C07C *127/19;* A01N *9/20*
U.S. Cl. 71—120 4 Claims

1. 3-(4-Crotyloxyphenyl)-1,1-dimethyl urea.

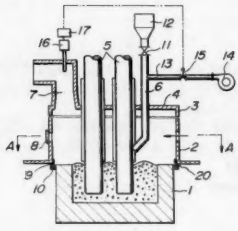
4. A herbicidally active composition for use in a paddy field, which comprises a herbicidally effective amount of 3-(4-crotyloxyphenyl)-1,1-dimethyl urea in a herbicidal carrier.

4,255,184

METHOD AND APPARATUS FOR REFINING FERROSILICON

Yoshiyuki Nakamura; Seiichi Matsubara, both of Tokyo; Takashi Matsui, Yokohama; Taiji Kumagai, Ichikawa; Taizo Senga, Waga, and Tsutomu Fukutsu, Yokohama, all of Japan, assignors to Japan Metals & Chemicals Co., Ltd., Tokyo, Japan

Filed Jun. 29, 1979, Ser. No. 53,480
Claims priority, application Japan, Jul. 18, 1978, 53-86782; Jul. 18, 1978, 53-86783
Int. Cl.[3] C21C *4/00, 5/52*
U.S. Cl. 75—10 R 2 Claims



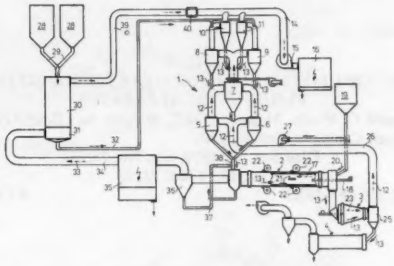
1. A method of refining ferrosilicon in a submerged arc type ferrosilicon-refining furnace having electrodes and a window for poking arranged on an upright wall of a heat-shielding hood provided around an upper rim of a shell of said furnace, wherein air invades from the poking window and a gap between a lower end of the upright wall and the upper rim of the shell and charged raw materials are poked through the poking window by a poking bar and caused to descend satisfactorily into a refining zone during progress of the refining reaction, the improvements comprising the steps of, charging raw materials into the region of the furnace near and around the electrodes through pipes opening above the level of charged raw materials in the shell of the furnace, heating and melting the charged raw materials between the shell and the electrodes to evolve CO gas, introducing air under pressure at the level of the charged raw materials in the shell of the furnace through air-introducing pipes arranged around the electrodes and opening above the level of the charged raw materials, burning the evolved gas around the electrodes in the furnace with the aid of the invaded air and the introduced air, and controlling the volume of the invaded air and the volume of the introduced air by adjusting at least one of said gap and an opening of the poking window so as to maintain the content of oxygen in exhaust gas from the furnace within the range of 12–17% by volume.

4,255,185

PROCESSES AND APPARATUS FOR REDUCING AND SUBSEQUENTLY PELLETIZING MOIST FINE-GRAINED ORE

Hans-Gerd Schulte, Enniger, and Heinz-Emil Merz, Diestedde, both of Fed. Rep. of Germany, assignors to Polysius AG, Beckum, Fed. Rep. of Germany

Filed Dec. 14, 1978, Ser. No. 969,463
Claims priority, application Fed. Rep. of Germany, Jan. 4, 1977, 2800211
Int. Cl.[3] C21B *13/00*
U.S. Cl. 75—36 29 Claims



1. In a process for reducing moist fine-grained ore containing zinc and/or lead impurities and wherein said ore is delivered to and preheated in a preheater, following which preheated ore is delivered to a reduction furnace and reduced in the presence of heat, following which reduced ore is discharged from said furnace and agglomerated, the improvement comprising providing a drying stage for said ore upstream from said preheater; separating said zinc and/or lead from ore in said furnace and discharging said zinc and/or lead from said furnace with furnace exhaust gases; delivering said exhaust gases in a direct path from said furnace to a purifier external of said furnace; separating said zinc and/or lead from said exhaust gases to purify the latter; and delivering purified exhaust gases directly following purification thereof to said drying stage for effecting drying of said ore.

16. In apparatus for reducing moist fine-grained ore containing zinc and/or lead impurities and including the preheater for said ore, a reduction furnace downstream from said preheater, means for delivering ore from said preheater to said furnace, means for heating ore in said furnace to a temperature to reduce said ore and separate therefrom the zinc and/or lead, agglomerating means downstream from said furnace, and means for delivering reduced ore from said furnace to said agglomerating means, the improvement comprising exhaust gas purifier means; conduit means connecting said purifier means and said furnace for delivering directly to said purifier means the gas and separated zinc and/or lead exhausted from said furnace; dryer means for said moist ore upstream from said preheater; means for delivering said ore from said dryer means to said preheater; and means for delivering purified exhaust gas from said purifier means directly to said dryer means.

4,255,186

IRON-CONTAINING ALLOYS RESISTANT TO SEAWATER CORROSION

Michel Rouby, and Jean-Paul Eymery, both of Imphy, France, assignors to Creusot-Loire, Paris, France

Filed Jan. 11, 1979, Ser. No. 2,748
Claims priority, application France, Jan. 19, 1978, 78 01452
Int. Cl.[3] C22C *30/00*
U.S. Cl. 75—122 9 Claims

1. Iron-containing alloys which have an elastic limit higher than 600 Newtons per mm^2 after quenching and ageing and are resistant to corrosion by seawater, for at least 30 months, said alloys consisting essentially of, by weight, less than 0.15% of

carbon, less than 2% of manganese, less than 1.5% of silicon, less than 0.03% of sulphur and phosphorus, from 34 to 40% of nickel, from 16 to 21% of chromium, from 6 to 18% of cobalt, from 2 to 3.5% of molybdenum, less than 0.25% of aluminum, from 2.5 to 3.5% of titanium, less than 2% of tungsten, and less than 0.015% of boron, the balance being iron and unavoidable impurities.

4,255,187

BISMUTH-CONTAINING STEEL

Debanshu Bhattacharya, Matteson, Ill.; Dennis T. Quinto, St. John, and Michael O. Holowaty, Crown Point, both of Ind., assignors to Inland Steel Company, Chicago, Ill.

Continuation-in-part of Ser. No. 5,965, Jan. 24, 1979. This application Aug. 29, 1979, Ser. No. 70,669

Int. Cl.³ C22C *38/60*

U.S. Cl. 75—123 AA **5 Claims**

1. In a free machining cast steel shape consisting essentially of, in wt.%,

carbon	0.06 to 1.0
manganese	0.3–1.6
silicon	0.30 max.
sulfur	0.03–0.50
phosphorous	0.12 max.
bismuth	0.05–0.40
iron	essentially the balance,

the improvement wherein:

the total amount of ingredients which lower the wetting ability of bismuth is less than the bismuth content of said steel.

4,255,188

FREE MACHINING STEEL WITH BISMUTH AND MANGANESE SULFIDE

Lynda M. Riekels, Munster, Ind., assignor to Inland Steel Company, Chicago, Ill.

Filed Aug. 29, 1979, Ser. No. 70,830

Int. Cl.³ C22C *38/60*

U.S. Cl. 75—123 AA **8 Claims**

1. In a free machining cast steel shape consisting essentially of, in wt.%,

carbon—0.06–1.0
manganese—0.3–1.6
silicon—0.30 max.
sulfur—0.03–0.50
phosphorous—0.12 max.
bismuth—0.05–0.40
iron—essentially the balance

said steel having, in its microstructure, manganese sulfide inclusions which act as microcrack initiators and bismuth-containing inclusions which act as liquid metal embrittlers, during a machining operation, the improvement wherein: said manganese sulfide inclusions have a mean size greater than 2 microns and less than 10 microns, to increase the number of manganese sulfide inclusions which act as microcrack initiators, compared to a steel having the same amount of manganese sulfide in inclusions of larger size, thereby enhancing the opportunity for said bismuth-containing inclusions to act as liquid metal embrittlers.

4,255,189

LOW METALLOID CONTAINING AMORPHOUS METAL ALLOYS

Ranjan Ray, Waltham, Mass., assignor to Allied Chemical Corporation, Morris Township, Morris County, N.J.

Filed Sep. 25, 1979, Ser. No. 78,631

Int. Cl.³ C22C *19/02, 19/07, 38/12, 27/04*

U.S. Cl. 75—123 B **5 Claims**

1. A substantially amorphous alloy consisting essentially of about 66–70 atom percent iron, about 8–10 atom percent boron, about 8–12 atom percent molybdenum and about 3–14 atom percent of one or more of nickel, cobalt and chromium.

4,255,190

ESSENTIALLY NON-PRECIOUS STAINLESS DENTAL ALLOY

Emil M. Prosen, Bala-Cynwyd, Pa., assignor to Neoloy Products, Inc., Posen, Ill.

Filed Oct. 25, 1979, Ser. No. 88,037

Int. Cl.³ C22C *19/07*

U.S. Cl. 75—134 C **3 Claims**

1. An essentially non-precious stainless alloy especially adapted for the adhesion of opaqueing porcelain having a fusing temperature of approximately 1800° F., consisting of:

Cobalt	40% to 60%
Chromium	25% to 32%
Tungsten	7% to 15%
Ruthenium	1% to 5%
Gallium	1% to 5%
Niobium	0.5% to 2%
Copper	0.5% to 2%
Tantalum	0.5% to 1%
Silicon	0.5% to 1%
Iron	0.5% to 1%

said alloy having a melting temperature of approximately 2650° F., and a linear coefficient of expansion of about 1.4×10^{-5} per °C.

4,255,191

GOLD-SILVER ALLOYS WITH GOOD TARNISH RESISTANCE FOR THE DENTAL ART

Rudolf Kropp, Pforzheim-Würm, Fed. Rep. of Germany, assignor to Degussa Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Feb. 20, 1980, Ser. No. 123,071

Claims priority, application Fed. Rep. of Germany, Mar. 2, 1979, 2908203

Int. Cl.³ C22C *5/02*

U.S. Cl. 75—134 N **13 Claims**

1. A gold-silver alloy having good tarnish resistance and suitable for the dental art, particularly for the casting of crowns, bridges and inlays consisting essentially of 33 to 48% gold, 0–5% platinum, 1–10% palladium, 0–0.2% iridium or ruthenium or a mixture thereof, 3–9% copper, 1–6% zinc, 0.5–4% tin and 2.5–10% indium, balance silver, wherein the mass ratio of copper to zinc is between 1:1 to 4:1, the content of copper is not higher than the sum of zinc, tin and indium, the content of palladium is at most three times as great as that of indium and does not exceed the sum of zinc, tin and indium.

4,255,192

HOMOGENOUS BONDING OF DISPERSED PHASE ALLOY

Charles F. Burns, Lansdowne, Pa., assignor to Pennwalt Corporation, Philadelphia, Pa.

Continuation-in-part of Ser. No. 34,091, Apr. 27, 1979, abandoned. This application Dec. 17, 1979, Ser. No. 103,887

Int. Cl.³ C22C *5/06, 7/00*

U.S. Cl. 75—169 **9 Claims**

1. In a process for making a dental alloy mixture which will amalgamate to form a restoration with superior compressive strength and low creep properties by mechanically mixing lathe cut dental amalgam alloy particles and silver-copper alloy spheres, the improvement comprising treating a mechanical mixture of lathe cut dental amalgam alloy particles of minus 200 mesh, having the composition: silver 40—75%, tin 20—30%; copper 2—30%, and from 0 to 30% of one or more metals selected from the group consisting of indium, zinc, gold, mercury, manganese, cadmium and aluminum, and spheroidal

silver-copper alloy of minus 325 mesh, having the composition: silver 54—72%; copper 24—40%, and varying amounts of one or more metals selected from the group consisting of nickel, zinc, tin or indium, the said mixture of alloys containing from about 20 to 50% by weight of the silver-copper alloy, with an effective amount of a treating solution selected from the group consisting of 5 volume % to 100 volume % hydrochloric acid, 5 volume % to 50 volume % sulfuric acid, 5 volume % to 20 volume % nitric acid and 5 volume % to 100 volume % methyl alcohol to aglommerate the mixture of alloy particles, separating the aglommerated mixture of alloy particles from the treating solution, washing the agglommerated alloy particles with water to remove the treating solution when the treating solution is one of the mineral acids, and finally drying the aglommerated mixture of alloy particles.

4,255,193

METHOD OF MANUFACTURE OF SINTERED PRESSED PIECES OF IRON REINFORCED BY IRON OXIDES

Milan Slesar; Vladimir Miskovic, and Eva Dudrova, all of Kosice, Czechoslovakia, assignors to Slovenska akademia vied, Bratislava, Czechoslovakia

Filed Sep. 18, 1979, Ser. No. 76,771

Claims priority, application Czechoslovakia, Sep. 22, 1978, 6109-78

Int. Cl.[3] **B22F** *3/16*

U.S. Cl. 75—206 **3 Claims**

1. A method of manufacturing sintered pieces comprising the steps of homogenously mixing iron powder having a particle size of from 0.01 to 0.315 mm with iron oxide in an amount of from 1 to 15 percent by volume, based on the total volume of the mixture, said iron oxide having a particle size of from 0.002 to 0.1 mm, and sintering the resulting pressings in a reduction atmosphere within a temperature range between 900° C. and 1300° C. for 0.5 to 4 hours.

4,255,194

PALLADIUM ALLOY BATHS FOR THE ELECTROLESS DEPOSITION

William V. Hough, Butler; John L. Little, Evans City, and Kevin E. Warheit, Butler, all of Pa., assignors to Mine Safety Appliances Company, Pittsburgh, Pa.

Filed Jan. 15, 1979, Ser. No. 3,351

Int. Cl.[3] **C23C** *3/02*

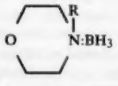
U.S. Cl. 106—1.24 **18 Claims**

1. A bath for the electroless deposition of palladium comprising an aqueous solution containing:

(a) between about 0.002 and 0.12 moles per liter of divalent palladium,

(b) between about 0.05 and 10 moles per liter of a base selected from ammonia, primary alkylamines having up to five carbon atoms, ethanolamine, ethylene diamine, N-methylated ethylene diamines or mixtures thereof,

(c) between about 0.005–0.21 moles per liter of a reducing agent selected from the group of tertiary amine boranes consisting of trialkylamine borane having the formula $R_1R_2R_3$ NBH_3, where R_1, R_2 and R_3 are methyl or ethyl groups; straight chain methoxy substituted dimethylamine boranes having the formula CH_3 $(OCH_2$ $CH_2)_n$ $N(CH_3)_2$ BH_3, where n is an integer from 1 to 4; and N alkyl substituted morpholine borane having the formula



where R is an alkyl group having not more than three carbon atoms.

4,255,195

COMPOSITIONS CONTAINING SILICON DIOXIDE

Heinz Holter, 39-41 Beisenstrasse, Gladbeck; Heinz Gresch, 89 Dornenstrasse, Dortmund-Derne, and Heinrich Igelbuscher, 60 Maroq-en-Baroeul-Strasse, Gladbeck, all of Fed. Rep. of Germany

Continuation of Ser. No. 721,469, Sep. 8, 1976, abandoned. This application Mar. 26, 1979, Ser. No. 24,045

Int. Cl.[2] **C09K** *3/28*

U.S. Cl. 106—18.12 **9 Claims**

1. In a heat- or fire-resistant refractory composition compatible with silicon dioxide and containing binder in admixture with at least one other ingredient, the improvement wherein the composition is sprayable or tampable and is suitable for coating steel girders or for lining an industrial furnace or metallurgical vessel, the binder is other than sodium silicate and the composition further comprises a heat-, flame- or fire-resistance increasing amount of dust-like silicon dioxide having a bulk weight within the approximate range of from 0.25 to 0.5 gram per milliliter, 95 percent of which has a grain size below 50 microns, approximately 82 to 95 percent of which is amorphous silicon dioxide and approximately 5 to 18 percent of which is crystalline quartz, the dust-like silicon dioxide comprising up to 50 percent of the composition.

4,255,196

LITHOGRAPHIC INK OF REDUCED VOLATILE SOLVENT CONTENT FOR REDUCING ATMOSPHERIC POLLUTION

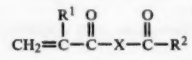
William D. Emmons, Huntingdon Valley; Peter R. Sperry, Doylestown, and Fred A. Kaplan, North Wales, all of Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

Filed Feb. 23, 1979, Ser. No. 14,676

Int. Cl.[3] **C09D** *11/06, 11/08;* **C08K** *5/11*

U.S. Cl. 106—29 **17 Claims**

1. In a lithographic printing ink containing a colorant, a binder resin, and a reactive diluent, the improvement in which the diluent comprises an oxidatively curable compound of the formula



where

—R^1 is —H or —CH_3

—R^2 is an aliphatic radical having 11–23 carbon atoms and containing at least one olefinic double bond, or mixtures thereof, R^2 being free of terminal double bonds, and

—X— is either —OR^3O— in which R^3 is an aliphatic or cycloaliphatic hydrocarbon residue containing from 2 to 10 carbon atoms, or —$O(CH_2CHR^4O)_n$— where R^4 is —H or —CH_3 and n is an integer of from 2–10, or mixtures thereof.

4,255,197

PROCESS FOR OBTAINING REFRACTORY MATERIALS WITH CONTROLLED CHARACTERISTICS OF POROSITY AND DENSITY

Antonio L. Peralta, Hacienda de la Carbonera No. 70, Bosques do Echegaray Naucalpan de Juarez, Estado de Mexico, and Luis M. C. Eslava, Recife 569-2, Col. Lindavista, Mexico 14, D.F., both of Mexico

Continuation-in-part of Ser. No. 40,138, May 18, 1979, abandoned, which is a continuation of Ser. No. 356,134, May 1, 1973, abandoned. This application Oct. 3, 1979, Ser. No. 81,316

Claims priority, application Mexico, May 4, 1972, 135214

Int. Cl.[3] **C04B** *00/00*

U.S. Cl. 106—41 **8 Claims**

1. A process for making lightweight refractory material comprising the sequence of the following steps:

(A) choosing the size of the solid plastic or polymer substrate particles;

(B) wetting the surface of solid particulate plastic or polymer substrates to form a film of liquid thereon, wherein the weight ratio of liquid for wetting the surface of the solid substrate to the solid substrate is from about 1:20 to about 1:5;

(C) mixing the wetted substrates with at least sufficient finely divided refractory materials to form a refractory coating thereon comprising generally abutting refractory particles;

(D) separating the coated substrates from any excess refractory material;

(E) drying said coated substrates to remove the film of liquid;

(F) recovering a refractory material substantially comprising individual refractory coated substrates; and

(G) heating the recovered refractory coated substrates to remove the plastic substrates and to develop a sintered ceramic bond and recovering empty ceramically bonded refractory shells having a shell thickness in the range of between 20 and 150 microns and an average wall thickness of about 50 microns.

7. A process for making lightweight refractory products comprising the sequence of the following steps:

(A) choosing the size of the solid plastic or polymer substrate particles;

(B) wetting the surface of solid particulate plastic or polymer substrates to form a film of liquid thereon, wherein the weight ratio of liquid for wetting the surface of the solid substrate to the solid substrate is from about 1:20 to about 1:5;

(C) mixing the wetted substrates with at least sufficient finely divided refractory materials to form a refractory coating thereon comprising generally abutting refractory particles;

(D) separating the coated substrates from any excess refractory material;

(E) drying said coated substrates to remove the film of liquid;

(F) recovering a refractory material substantially comprising individual refractory coated substrates and an average wall thickness of about 50 microns;

(G) heating the recovered refractory coated substrates to remove the plastic substrates and to develop a sintered ceramic bond and recovering empty ceramically bonded refractory shells having a shell thickness in the range of between 20 and 150 microns;

(H) preparing a refractory product batch incorporating said cellular material;

(I) forming a refractory product from said batch; and

(J) heating the formed refractory product to develop a ceramic bond.

4,255,198

GLASS FOR SEALING TO MOLYBDENUM METAL

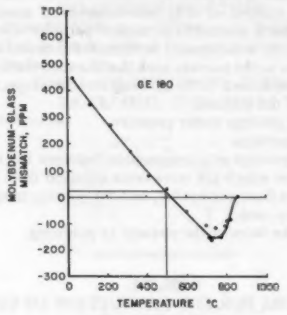
Paul S. Danielson, Big Flats; William H. Dumbaugh, Jr., and Henry E. Hagy, both of Painted Post, all of N.Y., assignors to Corning Glass Works, Corning, N.Y.

Filed Nov. 9, 1979, Ser. No. 92,698

Int. Cl.³ C03C *3/04, 3/10, 3/30*

U.S. Cl. 106—52 **1 Claim**

1. A glass composition suitable for sealing to molybdenum metal, said glass exhibiting a strain point in excess of 730° C., a liquidus temperature less than 1200° C., a viscosity at the liquidus of at least 40,000 poises, axial compression at room temperature not exceeding 350 PPM and axial compression or tension not exceeding 150 PPM at 500° C. when sealed to molybdenum metal, a coefficient of thermal expansion (0°–300° C.) less than 48×10^{-7}/°C., but greater than 43×10^{-7}/°C., and consisting



essentially, in weight percent on the oxide basis, of 62–64% SiO_2, 14–16% Al_2O_3, 10–13% CaO, and 7–9% SrO.

4,255,199

STABLE, CHEMICALLY-STRENGTHENABLE LITHIUM ALUMINOSILICATE GLASSES

Richard F. Reade, Corning, N.Y., assignor to Corning Glass Works, Corning, N.Y.

Filed Nov. 5, 1979, Ser. No. 91,549

Int. Cl.³ C03C *3/10, 3/30, 21/00*

U.S. Cl. 106—53 **3 Claims**

1. A glass having a composition within the general ternary system Li_2O-Al_2O_3-SiO_2 wherein the stoichiometry varies over the range of about $Li_2O{\cdot}Al_2O_3{\cdot}4\text{-}6SiO_2$ and wherein PbO is substituted for Li_2O in amounts between about 0.5–1.5 moles, which resists the development of devitrification at temperatures in the vicinity of the softening point of the glass, which resists surface wrinkling, cracking, spalling, haze, and devitrification when held for several hours at temperatures above the annealing point of the glass but below the softening point thereof, which can be chemically strengthened to demonstrate modulus of rupture values in excess of 60,000 psi, which displays excellent chemical durability, and which consists essentially, expressed in terms of weight percent on the oxide basis as calculated from the batch, of

SiO_2	59–71
Al_2O_3	20–28
Li_2O	4.5–7.5
PbO	3–9

wherein the mole ratio Al_2O_3:Li_2O+PbO ranges between about 0.95–1.05.

4,255,200

METHOD OF MANUFACTURING POROUS, WATER-PERMEABLE AND NOT FROST-SUSCEPTIBLE TERRA COTTA PAVINGS USABLE AS GROUND COATING AND PAVINGS THUS OBTAINED

Michel A. Rheins, Paris, France, assignor to Socri International, Luxembourg, Luxembourg

Continuation-in-part of Ser. No. 784,557, Apr. 4, 1977, abandoned. This application Dec. 15, 1977, Ser. No. 860,770

Claims priority, application Luxembourg, Dec. 17, 1977, 76412

Int. Cl.³ C04B *33/04*

U.S. Cl. 106—71 **17 Claims**

1. A method of manufacturing terra cotta pavings which may be used as ground coating, said pavings not being frost-

susceptible, being porous and water-permeable, the method comprising the steps of:

intimately mixing 100 parts by volume of clay with 80 to 160 parts by volume of dry, non-compressed sawdust, the sawdust being essentially formed of particles whose average diameter is comprised between 0.5 mm and 4 mm;

adding water to the mixture such that the total water content is between 8 and 30% by weight with respect to the weight of the mixture;

forming the pavings under pressure;

drying the pavings;

baking the pavings at a temperature between the temperature, above which the terra cotta obtained from the clay used is not frost-susceptible, and the melting temperature of this clay, and,

subjecting the faces of the pavings to pumicing.

4,255,201

RAW MIXTURE FOR THE PRODUCTION OF CEMENT CLINKER

Boris I. Nudelman; Anatoly Y. Gadaev; Marsel Y. Bikbau, and Petr T. Shishkin, all of Tashkent, U.S.S.R., assignors to Tashkentsky Nauchno-Issledovatelsky I Proektny Institut Stroitelnykh Materilov "Niistromproekt", Tashkent, U.S.S.R.

Division of Ser. No. 804,268, Jun. 7, 1977, Pat. No. 4,179,302. This application Aug. 6, 1979, Ser. No. 64,107

Claims priority, application U.S.S.R., Aug. 20, 1976, 2400246

Int. Cl.³ C04B *7/36*

U.S. Cl. 106—106 **8 Claims**

1. A method for the production of cement clinker which comprises, grinding a composition of lime component 55 to 63 percent by mass, a clay component 23 to 17 percent by mass, a ferrous component 4 to 1 percent by mass, calcium chloride 17.8 to 4 percent by mass, potassium chloride 0.1 to 7.5 percent by mass, sodium chloride, 0.1 to 7.5 percent by mass, and calcining the ground composition at a temperature of about 1,000° to 1,200° C.

4,255,202

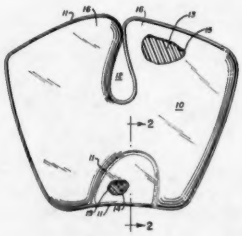
VISCOUS, FLOWABLE, PRESSURE-COMPENSATING FITTING COMPOSITIONS

Jack C. Swan, Jr., Boulder, Colo., assignor to Hanson Industries Inc., Boulder, Colo.

Continuation-in-part of Ser. No. 882,644, Mar. 2, 1978, abandoned, which is a continuation-in-part of Ser. No. 723,912, Sep. 16, 1976, Pat. No. 4,108,928, which is a continuation-in-part of Ser. No. 663,213, Mar. 2, 1976, abandoned. This application Nov. 7, 1979, Ser. No. 91,955

Int. Cl.³ A43B *5/04*; C08L *91/06*

U.S. Cl. 106—122 **59 Claims**



1. A viscous, flowable, pressure-compensating composition, which essentially consists of:

a substantially homogeneous, substantially stable, viscous, flowable, semi-solid, non-resilient, continuous phase formed of the combination of wax, which is an essentially non-flowable solid, and liquid oil, and,

as a discontinuous phase, about 1 part by weight of discrete, lightweight, sturdy, essentially non-resilient, unicellular particles in the form of hollow, glass microbeads, per about 0.7 to 9 parts by weight of said continuous wax-oil phase,

said sturdy glass microbeads being substantially uniformly distributed as a discontinuous phase in said continuous wax-oil phase;

said combination of wax and oil having a density of about 0.5 fo 1 gm./cc., said sturdy, glass microbeads having a density of about 0.05 to 0.70 gm./cc., but always lower than the density of said combination of wax and oil, so as to lower the overall density of said composition, and,

said composition having a specific gravity in the vicinity of about 0.2 to 0.8;

said continuous phase having the combination of wax and oil being present in the composition in an amount sufficient (a) to more than merely thinly coat substantially the entire outer surface of essentially each of said distributed glass microbeads, and (b) to provide a volume that is more than the volume of the interstital spaces of the quantity of glass microbeads alone;

said composition being further characterized by being a viscous, flowable and thus deformable, pressure-compensating composition, being substantially incompressible, having a substantially homogenous consistency and not substantially changing in volume responsive to ambient temperatures or ambient temperature changes, being resistant to sag, flowing under shear stress after its yield point is reached, having a minimum yield point of at least about 4 gm./cm.², flowing in response and conformance to continuously applied pressure, and, when confined during conditions of use, undergoing flow and deformation away from areas or regions of highest pressure loads, being resistant to flow in response to instantaneously applied pressure, and, at least in part, being recoverable momentarily from deformation following the relief of deforming pressure loads.

4,255,203

PIGMENT FORMULATIONS

Joachim Kranz, Ludwigshafen, and Reinhard Sappok, Heidelberg, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Jan. 29, 1980, Ser. No. 116,384

Int. Cl.³ C09C *3/02*

U.S. Cl. 106—288 Q **14 Claims**

1. A pigment formulation which comprises

(a) a finely divided organic pigment,

(b) from 2 to 20% by weight, based on (a), of one or more urea derivatives of the formula

$$K—NH—CO—NH—R)_2 \quad (I)$$

where R is C_{12}–C_{18}-alkyl, C_{12}–C_{18}-alkenyl, C_8–C_{18}-alkoxypropyl or $—(CH_2)_3—O—(C_2H_4O)_n—R^1$, where R^1 is C_2–C_8-alkyl or phenyl and n is 1, 2, 3 or 4, and K is 1,5-naphthylene or 4,4'-diphenylenemethane, and

(c) from 0 to 5% by weight, based on (a + b), of conventional additives for pigment formulations.

4,255,204

PROCESS FOR INHIBITING THE DETERIORATION OF CANE SUGAR

Leoncio R. Orozco Rodriguez, Calle 27 #559 Apt. 1, Vedado, Ciudad de la Habana; Jose A. Urrutia Herrera, Goicuria #157 altos entre Libertad y E. Palma, Stos Suarez, C. de la Habana, and Eduardo R. Suarez, Calle 80 #8503, Güira de Melena, Habana, all of Cuba

Filed Jan. 24, 1979, Ser. No. 6,120

Int. Cl.³ C13B *3/00*

U.S. Cl. 127—46 R **2 Claims**

1. A process for inhibiting the deterioration of cane sugar products during storage comprising heating a cane sugar syrup

at a temperature of from 70° to 100° C. in an alkaline medium at a pH of from 7 to 10 for a period of time sufficient to reduce the amino acid content of the syrup 30 to 80% and to increase the buffer action by transforming reducing sugars to organic acids so that deterioration is delayed by stabilization of the syrup pH at substantial neutrality.

4,255,205

METHOD OF PRODUCING GRAIN-ORIENTED SILICON STEEL SHEETS HAVING SUBSTANTIALLY NO GLASS FILM

Nobuyuki Morito; Toshitomo Sugiyama, and Yoshio Obata, all of Kobe, Japan, assignors to Kawasaki Steel Corporation, Kobe, Japan

Filed Dec. 12, 1979, Ser. No. 102,761

Claims priority, application Japan, Dec. 27, 1978, 53-159967

Int. Cl.³ C23F *7/10*; H01F *1/04*

U.S. Cl. 148—113 **4 Claims**

1. In a method of producing grain-oriented silicon steel sheets having substantially no glass film, wherein a cold rolled silicon steel sheet having a final guage is subjected to a decarburization annealing to form subscale on the surface of the steel sheet, an annealing separator consisting mainly of Al_2O_3 is applied on the subscale and then the steel sheet is subjected to a final annealing, an improvement comprising using an annealing separator consisting of 5–30% of finely particulate serpentine, 0.2–20%, calculated as strontium or barium, of compound containing strontium or barium, 2–30% of CaO or $CA(OH)_2$ and the remainder being Al_2O_3.

4,255,206

METHOD FOR MANUFACTURING A SEMICONDUCTOR STRUCTURE

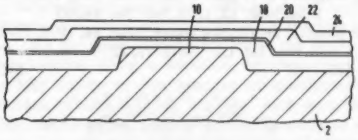
Wolfgang Endler, Munich, and Karl-Heinz Zschauer, Grafing, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Dec. 18, 1978, Ser. No. 970,177

Claims priority, application Fed. Rep. of Germany, Dec. 22, 1977, 2757470

Int. Cl.³ H01L *21/208*

U.S. Cl. 148—171 **7 Claims**



1. A method of manufacturing an array of subcomponents intended for subsequent processing and division into individual semiconductor components each having a single mesa of semiconductor material on the flat surface of which a thin layer of semiconducting material of uniform thickness, substantially free of crystal faults, has been formed, comprising the steps of:

removing portions of the surface of a single-crystalline semiconductor substrate, which surface lies approximately parallel to a single-crystal face of the substrate, in a grid-like pattern to form a plurality of plane-topped mesas the superficial extent of the top of each of which is not greater than 1.2 mm in diameter, in the case of circular structures, and along a side, in the case of straight sided structures,

etching the entire surface of the substrate including the mesas,

depositing, by means of liquid-phase epitaxy from a solution of semiconductor compound the supersaturation of which is not more than 3% at the start of deposition, a semiconductor layer on the entire etched surface, the layer being approximately 1 μm in thickness on the plane-topped surface of the mesa.

4,255,207

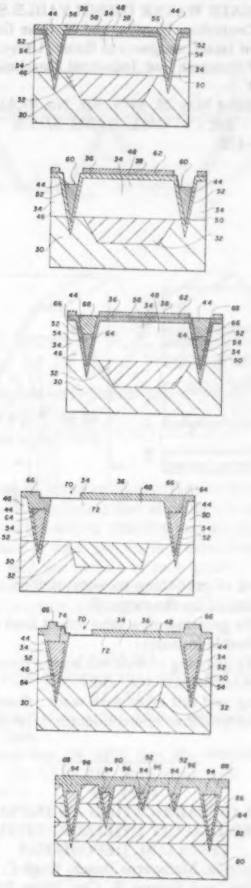
FABRICATION OF ISOLATED REGIONS FOR USE IN SELF-ALIGNING DEVICE PROCESS UTILIZING SELECTIVE OXIDATION

Hugh C. Nicolay, Melbourne Village, and William G. Lucas, Indian Harbor Beach, both of Fla., assignors to Harris Corporation, Melbourne, Fla.

Filed Apr. 9, 1979, Ser. No. 28,289

Int. Cl.³ H01L *21/76, 27/10*

U.S. Cl. 148—174 **9 Claims**



1. A process for laterally isolating portions of a first semiconductor layer of a first conductivity type formed on a second semiconductor layer of a second conductivity type comprising:

forming a first oxide layer on said first semiconductor layer of a first thickness;

forming an oxide inhibiting mask layer on said first oxide layer;

removing portions of said mask layer and said first oxide layer to expose surface areas of said first semiconductor layer;

preferentially etching the exposed area of said first and second semiconductor layers to form grooves extending through said first semiconductor layer into said second semiconductor layer;

forming a second oxide layer on exposed surfaces of said grooves of a second thickness;

depositing polycrystalline material on said second oxide layer in said grooves to substantially fill said grooves; and

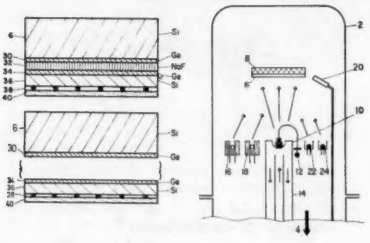
selectively oxidizing said polycrystalline material to form a third oxide layer of a third thickness greater than said first thickness.

4,255,208

METHOD OF PRODUCING MONOCRYSTALLINE SEMICONDUCTOR FILMS UTILIZING AN INTERMEDIATE WATER DISSOLVABLE SALT LAYER

Siegfried G. Deutscher, Herzlia, and Enrique Grunbaum, Kfar Saba, both of Israel, assignors to Ramot University Authority for Applied Research and Industrial Development Ltd., Tel Aviv, Israel

Filed May 25, 1979, Ser. No. 42,423
Int. Cl.³ H01L *21/203, 21/306*
U.S. Cl. 148—175 **18 Claims**



1. A method of producing monocrystalline semiconductor films, characterized by the steps of:

(a) epitaxially growing on a substrate at least one layer of a salt dissolvable in water;

(b) epitaxially growing on said salt layer a layer of the monocrystalline semiconductor; and

(c) dissolving said salt layer with water, thereby separating the monocrystalline semiconductor layer from the substrate.

4,255,209

PROCESS OF FABRICATING AN IMPROVED I²L INTEGRATED CIRCUIT UTILIZING DIFFUSION AND EPITAXIAL DEPOSITION

William R. Morcom, Melbourne Beach; Hugh C. Nicolay, Melbourne Village, and Eugene R. Cox, Palm Bay, all of Fla., assignors to Harris Corporation, Melbourne, Fla.

Division of Ser. No. 875,824, Feb. 7, 1978. This application Dec. 21, 1979, Ser. No. 106,341
Int. Cl.³ H01L *21/20, 21/22, 27/10*
U.S. Cl. 148—175 **12 Claims**

1. A process for fabricating a high gain complementary pair of bipolar transistors comprising:

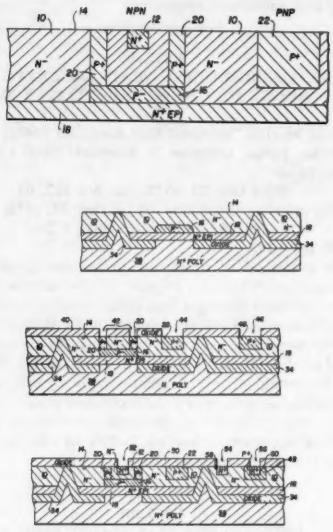
diffusing impurities of a first conductivity type in a first surface of a substrate of a second conductivity type opposite said first conductivity type to form a first region;

epitaxially forming a layer on said first surface of said second conductivity type;

diffusing impurities of said first conductivity type into a second surface of said substrate opposite said first surface to form a second region extending from said second surface to said first region and to form a third region;

diffusing impurities of said second conductivity type into said second surface to form a fourth region separated from said third region by said second region;

said epitaxial layer, said first region and said fourth region forming the emitter, base and collector respectively of a



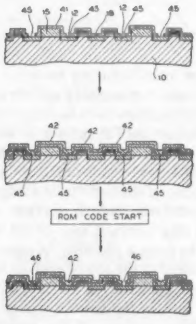
first transistor and said third region, said substrate and said second region forming the emitter, base and collector respectively of a second transistor complementary to said first transistor.

4,255,210

METHOD FOR MANUFACTURING A READ-ONLY MEMORY DEVICE

Yasushi Okuyama, and Tsuyoshi Suzuki, both of Kumamoto, Japan, assignors to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Mar. 12, 1979, Ser. No. 19,293
Claims priority, application Japan, Mar. 14, 1978, 53-29616
Int. Cl.³ H01L *21/22*
U.S. Cl. 148—187 **5 Claims**



1. A method of manufacturing a read-only memory comprising the steps of: providing a semiconductor substrate of one conductivity type, said substrate having a thick field insulator formed selectively on a major surface thereof, and a plurality of impurity regions of the opposite conductivity type formed in the major surface thereof; forming a first insulating film on

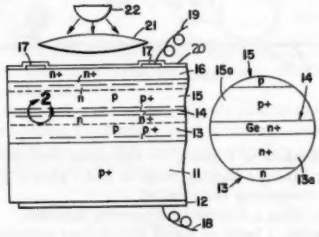
said thick field insulator and on the surface of said impurity regions; providing a plurality of first apertures in said first insulating film by means of a first mask to expose the surface portions of all of said impurity regions; forming a second insulating film on said first insulating film and within said first apertures to cover the exposed surface portions of said impurity regions; and providing second apertures in said second insulating film within only some selected ones of said first apertures by means of a second mask to expose the impurity regions in surface portions of only some selected first apertures.

4,255,211

MULTILAYER PHOTOVOLTAIC SOLAR CELL WITH SEMICONDUCTOR LAYER AT SHORTING JUNCTION INTERFACE

Lewis M. Fraas, Albany, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Dec. 31, 1979, Ser. No. 108,767
Int. Cl.³ H01L *31/04*
U.S. Cl. 136—249 **8 Claims**



1. A high efficiency, multi-junction photovoltaic solar cell for use with a light concentrating element, comprising a single crystal substrate without an internal light sensitive junction, two or more successive homogeneous layers of different semiconductor material deposited on said substrate, each layer containing within it a light sensitive p/n junction of a similar polarity, said p/n junction being a homojunction, each layer having essentially the same lattice constant as said single crystal substrate, each layer having a tunneling, shorting junction contact with the layer immediately above the below it, said shorting junction being a tunneling heterojunction, a thin substantially transparent low bandgap semiconductor layer at the inerface of said shorting junction, each layer being of sufficient thickness and appropriate composition to develop essentially the same zero voltage light generated current as the other layers, and each successive layer absorbing light energy at a different wavelength.

4,255,212

METHOD OF FABRICATING PHOTOVOLTAIC CELLS

Terry I. Chappell, Concord, and Richard M. White, Berkeley, both of Calif., assignors to The Regents of the University of California, Berkeley, Calif.

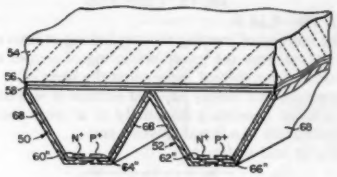
Division of Ser. No. 912,724, Jun. 5, 1978, Pat. No. 4,200,472. This application Jul. 2, 1979, Ser. No. 53,929
Int. Cl.³ H01L *31/06, 21/20, 21/223*
U.S. Cl. 148—1.5 **3 Claims**

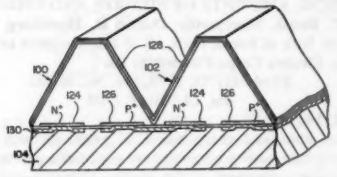
1. A method of fabricating a plurality of diode elements in a silicon solar cell comprising the steps of forming an oxide layer on a single crystal silicon substrate,

defining a plurality of spaced oxide strips from said oxide layer through photoresist masking and etching said oxide layer,

applying a preferential etchant to exposed silicon material between said spaced oxide strips; thereby etching grooves through said silicon substrate and defining a plurality of silicon elements having generally trapezoidal cross-sections,

implanting ions of one conductivity in one surface of each groove including first aligning said substrate with respect to an ion source whereby ions are directed at said one surface of each groove in a direction substantially parallel to the surface of said groove in which ions are not to be implanted,





implanting ions of opposite conductivity in the other surface of each groove including first aligning said substrate with respect to an ion source whereby ions are directed at said other surface of each groove in a direction substantially parallel to said one surface of each groove, and

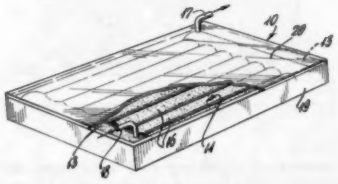
depositing a metallic interconnection layer in said grooves thereby interconnecting adjacent silicon elements.

4,255,213

METHOD FOR PRODUCING SOLAR COLLECTOR PLATES

James D. Redmond, Ann Arbor, Mich., assignor to Amax Inc., Greenwich, Conn.

Filed Apr. 24, 1978, Ser. No. 899,115
Int. Cl.³ C23F *7/04;* F24J *3/02*
U.S. Cl. 148—6.11 **7 Claims**



1. In a method for producing a solar collector which comprises a collector box; a collector plate through which a heat exchange fluid circulates for transferring heat from said heat plate to a remote location, said plate being placed in said collector box and having a collector surface of stainless steel or another metal flash coated with nickel or chromium which surface is provided with an oxide layer to provide a selective coating and a glass cover for enclosing said plate, the improvement which comprises immersing the collector plate in a molten bath of a dichromate salt of at least one metal selected from

the group consisting of sodium and potassium for a time sufficient to provide the collector surface with an oxide coating having a Figure of Merit of between about 4 and about 13.

4,255,214

METHODS OF MANUFACTURING AND PROTECTING MIRRORS

Frank M. Workens, Jamestown, N.Y., assignor to Falconer Plate Glass Corporation, Falconer, N.Y.

Filed Nov. 21, 1977, Ser. No. 853,409
Int. Cl.³ C23F *9/00*
U.S. Cl. 148—6.14 R **2 Claims**

1. The method of treating mirrors having at least one metal layer selected from the group consisting of copper and silver and combinations thereof comprising the steps of,

(a) applying to a freshly exposed surface of said metal layer a solution consisting essentially of at least about 0.25% tolyltriazole in a liquid solvent, and

(b) drying said surface.

4,255,215

ORIENTED LOW-ALLOY IRON CONTAINING CRITICAL AMOUNTS OF SILICON AND CHROMIUM

Gary C. Rauch, Murrysville; Donald R. Thornburg, and Karl Foster, both of Forest Hills, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed May 11, 1979, Ser. No. 38,361
Int. Cl.³ H01F *1/04*
U.S. Cl. 148—31.55 **2 Claims**

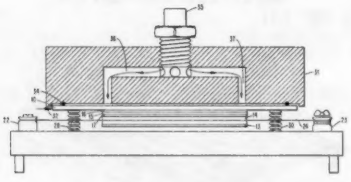
1. An improved composition of primarily recrystallized low-alloy iron having improved magnetic characteristics having a major proportion of the grains exhibiting a (110) [001] texture and having a primary recrystallized microstructure, said alloy consisting essentially of 0.6–1.0% silicon, 0.4–0.8% chromium, up to 0.15% manganese, up to 0.001% carbon, up to 0.005% sulfur, up to about 0.01% oxygen, up to 3% cobalt, with the balance being essentially iron with incidental impurities.

4,255,216

PELLICLE RING REMOVAL METHOD AND TOOL

Jay W. Conant, Richmond; Donald W. Fisher, Colchester, and David D. Fox, Milton, all of Vt., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jan. 14, 1980, Ser. No. 111,749
Int. Cl.³ B32B *31/24*
U.S. Cl. 156—80 **9 Claims**



1. A method of separating two workpieces adhesively bonded together with a layer of adhesive which is embrittled at a temperature below zero degrees centigrade, one of the workpieces and the adhesive having a coefficient of expansion substantially greater then the other of said workpieces comprising the steps of;

fixedly holding the workpiece with the higher coefficient of expansion,

applying a coolant only to the side of the workpiece having the smaller coefficient of expansion opposite the adhesive layer,

maintaining the coolant in contact with the workpiece having the smaller coefficient of expansion for a period of time sufficient to cool the adhesive layer to below its embrittlement temperature and to shear the adhesive layer at its interface with the workpiece having the smaller coefficient of expansion, and

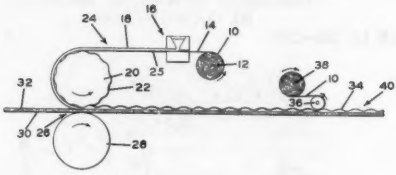
applying a separating force to the workpieces to separate the workpieces at the interface at which the embrittled adhesive layer is sheared.

4,255,217

METHOD OF FORMING AN EMBOSSED DECORATIVE SURFACE COVERING

John P. Franze, Lancaster, Pa., assignor to Armstrong Cork Company, Lancaster, Pa.

Filed Aug. 12, 1977, Ser. No. 823,914
Int. Cl.³ B32B *31/00*
U.S. Cl. 156—209 **16 Claims**



1. A method of forming an embossed decorative surface covering having a backing material and a plastic-type surface material comprising the steps of:

(a) providing a strippable supporting material,

(b) coating a layer of liquid plastic-type material onto the strippable supporting material to form a strippable supporting material/plastic-type material composite,

(c) positioning the strippable supporting material of said composite against a heated embossing roll having a desired pattern,

(d) heating said composite by maintaining said composite against said embossing roll through an arc equal to a substantial part of the circumference of said roll as said roll is rotated so that said liquid plastic-type material becomes gelled and so that said liquid plastic material is raised in temperature in preparation for embossing and fusion,

(e) bringing a backing material into contact with the plastic-type material of said composite,

(f) applying pressure to the combination of the composite and the backing material while the composite continues to be heated by said embossing roll to bond the plastic-type material to the backing material and to fuse the plastic-type material in a pattern that duplicates the desired pattern of the embossing roll, and

(g) removing said strippable material from the fused plastic-type material of the embossed decorative surface covering.

4,255,218

METHOD AND APPARATUS FOR APPLYING ADHESIVE STRIP

Wilfred E. Stageberg, St. Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Feb. 28, 1979, Ser. No. 15,905
Int. Cl.³ B65C *9/20*
U.S. Cl. 156—238 **6 Claims**

1. A method for applying a portion of a strip of adhesive releasably carried on a liner to one surface of a member in an arcuate pattern, said method comprising:

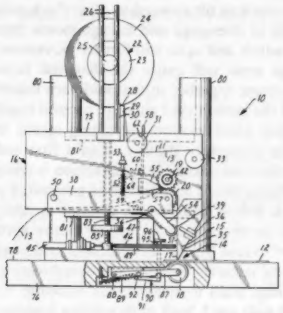
providing a platen of a firm material having an edge surface with a radius dimension of less than about $\frac{1}{8}$ inch;

pulling the liner along a predetermined path with a portion

extending around the edge surface with the edge surface transverse of the liner and with the surface of the liner opposite the strip of adhesive contacting the edge surface;

pressing the surface of the member against the strip of adhesive at the radiused edge surface so that movement of the liner along said path will cause relative movement between the radiused edge surface and the surface of the member while transferring the adhesive to the surface of the member; and

pivoting the member in a plane generally parallel to the edge surface to cause local deformation of said adhesive strip at the edge surface so that said strip of adhesive will be applied in the arcuate pattern.



4,255,219

PROCESS FOR MAKING COMPOSITE LAMINATED POLYAMIDE SHEET MATERIAL

Michael P. Dellavecchia, Sparta, N.J., assignor to Allied Chemical Corporation, Morris Township, Morris County, N.J.

Division of Ser. No. 815,381, Jul. 13, 1977, abandoned. This application Aug. 28, 1978, Ser. No. 937,393

Int. Cl.³ B29D *7/02;* **B32B** *27/34*

U.S. Cl. 156—243 **3 Claims**

1. In a process for providing a composite laminated sheet material comprising the steps of forming a first layer comprising polyepsiloncaprolactam, forming a second reinforcing layer of thermoplastic resin and laminating said layers together while said resin is still in molten condition, the improvement comprising utilizing as said reinforcing layer a sheet material capable of being laminated immediately after extrusion and being formed of at least one layer comprising polyepsiloncaprolactam and about 0.05 to 1% by weight, based upon the weight of the polyepsiloncaprolactam, of a dibasic carboxylic acid or anhydride or ester thereof and at least one reinforcing mat of long glass fibers encased within said layer.

4,255,220

METHOD FOR SUPPLYING A LABEL TO AN ARTICLE SURFACE

Leo Kucheck, Irvine, and Michael Crankshaw, Santa Fe Springs, both of Calif., assignors to Label-Aire Inc., Fullerton, Calif.

Filed Feb. 2, 1979, Ser. No. 9,276

Int. Cl.³ B65C *9/18, 9/28*

U.S. Cl. 156—285 **6 Claims**

4. A method for supplying a label to a surface of an article comprising:

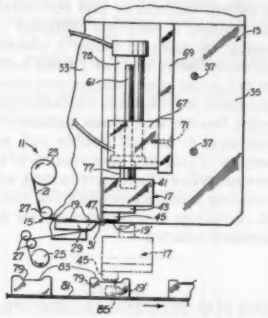
moving the article to be labeled through a label applying station;

providing a label receiver having a label receiving face and passage means opening at said face;

supplying a label to a label receiving face of the label receiver when the label receiver is in a first position;

applying reduced pressure to the passage means of the label receiver which is sufficient to releasably retain the label on the label receiving face of the label receiver;

advancing the label receiver along a path from the first position toward the labeling station to a label applying position in which the label receiving face of the label receiver is spaced from the article as the article is moved through the label applying station, the label receiving face of the label receiver being substantially closer to the article in the label applying position than in the first position when the article is moved through the label applying station;



applying a blast of gas through the passage means of the label receiver and against the label on the label receiving face of the label receiver to remove the label from the label receiving face when the label receiver is in the extended position and to transfer the label to the surface of the article at the labeling station without pressing the label against the article with the label receiver; and

returning the label receiver to the first position along said path whereby the label receiver moves in both directions along said path between said first position and said label applying position.

4,255,221

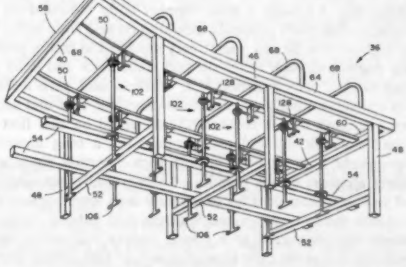
SURFBOARD AND METHOD AND APPARATUS FOR MAKING SURFBOARDS AND LIKE MOLDED STRUCTURES

Gary W. Young, Box 754, Marshall, Calif. 94940

Filed Dec. 8, 1978, Ser. No. 967,777

Int. Cl.³ B32B *31/00;* **B28B** *21/36;* **B29C** *17/04;* **A63C** *5/00*

U.S. Cl. 156—382 **12 Claims**



1. An apparatus for making a laminated article of predetermined curvature, said article including a central core having said predetermined curvature and a separate laminated outer skin construction surrounding said core, said apparatus comprising:

(a) a housing arrangement defining a vacuum chamber

adapted to recieve said central core and said laminated outer skin construction, said housing arrangement including outermost flexible wall means defining at least one side of said chamber;

(b) means for creating a vacuum in said chamber whereby to draw said flexible wall means tightly around a section of said core and outer skin construction for causing the latter to conform to the curvature of said core section so as to provide the same curvature for the article itself; and

(c) means located outside and on one side of said chamber for aiding said flexible wall means in causing a section of said skin construction to conform to a predetermined one of the curved surfaces of said core section, said aiding means including at least one elongated support member sufficiently bendable to define a plurality of different curvatures including said one curved surface of said core section in a given plane, said support member being positioned outside said chamber but sufficiently close to said outermost flexible wall means defining one side of said chamber so as to aid said flexible wall means in causing said section of said skin construction to conform to said one curved surface of said core section, said aiding means also including means for bending said member to any one of said curvatures in said plane and for maintaining it in the curvature selected.

4,255,222

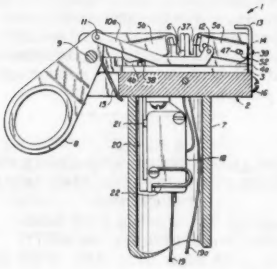
APPARATUS FOR SPLICING THERMOPLASTIC YARNS

Lloyd M. Guenther, Severna Park, Md., assignor to Chevron Research Company, San Francisco, Calif.

Filed Dec. 17, 1979, Ser. No. 103,817

Int. Cl.³ B65H *69/06, 69/08*

U.S. Cl. 156—433 **5 Claims**



1. A splicing apparatus for splicing thermoplastic yarns or tapes and adapted to be hand-held, comprising in operative relationship, a handle, a slide support body mounted on said handle, a slide track pivotally mounted on said slide body, first and second slide blocks operatively mounted in facing position with respect to each other on said slide track and each provided with a yarn insertion slot, wherein said yarn insertion slots are substantially parallel to each other; first and second yarn clamping means respectively mounted on said first and second slide blocks and each comprising a tang means for respectively holding yarn in said yarn insertion slots; a hot cutting element means positioned substantially diagonally to said yarn insertion slots for diagonally melt severing said thermoplastic yarns or tapes and wherein said cutting element is operatively connected to a power supply through a switch means for controlling the flow of power to said cutting element and operatively connected to one of the slide blocks through a linkage means for closing said switch; a pivotable trigger means connected to a first hinge arm operatively connecting said trigger means to said first slide block and said first yarn clamping means and a second hinge arm operatively connecting said trigger means to said second slide block and said second yarn clamping means wherein first movement of said trigger will cause said tangs on said yarn clamping means to enter said yarn insertion slots in said slide blocks to clamp yarns in said slots and further movement of said trigger will cause said slide blocks to move toward each other causing one of said slide blocks to activate said linkage means to close said switch thereby energizing said cutting element, and upon further movement of said trigger said hinge arms will cause said slide track to tilt upward to clear the heating element and slide block to disengage said linkage means thereby deactivating said switch, and upon still further movement of said trigger said hinge arms will cause the diagonal faces of said slide blocks to come together so that said yarn insertion slots are in a line and the molten yarn ends are pressed together; a first and second slide block motion restraining means for respectively preventing premature motion of said first and second slide blocks before the yarns clamping action is completed; a vertical restraining means for preventing premature pivoting of said slide track before said cutting element is energized and said yarn tails are severed; and a trigger return spring operatively connected to said trigger for returning said trigger to its original position upon its release thereby activating said first and second hinge arms to successively unclamp the joined yarn, pivot said slide track back to its starting position while moving said slide blocks apart to clear said cutting element, and return said slide blocks to their starting positions.

4,255,223

METHOD AND APPARATUS FOR PRODUCING A COLLAPSIBLY FOLDABLE PACKAGING SLEEVE HAVING A POLYGONAL CROSS-SECTION

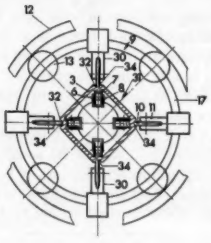
Franz J. Saul, Gürzenicher Str. 61, 5160 Düren, Fed. Rep. of Germany

Division of Ser. No. 579,058, May 20, 1975, Pat. No. 4,120,323. This application Aug. 4, 1978, Ser. No. 931,263

Claims priority, application Fed. Rep. of Germany, May 20, 1974, 2424413

Int. Cl.³ B31F *1/00*

U.S. Cl. 156—443 **8 Claims**



1. Apparatus for making polygonal tubular packaging sleeves comprising:

a stationary spindle,

means for wrapping strips of material in overlayed relationship on said spindle,

means for applying bonding material to said strips before they are wrapped on said spindle,

means for causing the tube formed by wrapping said strips on said spindle to be removed axially from said spindle,

and forming means positioned so as to be inside said tube as it is removed from said spindle, said forming means comprising at least two opposite rows of rollers positioned about a second spindle and being, with respect to the axis of said spindle, arrayed radially and progressively outward therefrom in the direction of movement of said tube from said second spindle.

4,255,224

MACHINE FOR THE MANUFACTURE OF BRUSHES

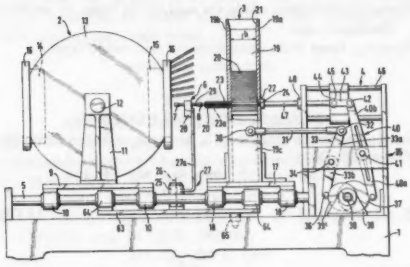
Reinhold Lorenz, Voehl-Oberorke, Fed. Rep. of Germany, assignor to Schlesinger GmbH & Co. Maschinenbau KG, Frankenberg, Fed. Rep. of Germany

Filed Mar. 20, 1979, Ser. No. 22,118

Claims priority, application Fed. Rep. of Germany, Mar. 23, 1978, 2812746

Int. Cl.[3] B32B *31/12;* A46D *3/04;* A46B *3/06*

U.S. Cl. 156—499 22 Claims



1. In a machine for the manufacture of brushes having at least one brush head mounting structure and a bristle bunch holder for holding bristle bunches, and means for guiding at least one of said bristle bunch holder and said brush head mounting structure for relative movement toward and away from each other, the improvement comprising a movable heating-element carrier on which is mounted at least two heating elements, said two heating elements being arranged between said bristle bunch holder and said brush head mounting structure with each heating element having a contact heating surface, said movable heating-element carrier being movable between a first engaging position, in which one heating surface engages a brush head on said brush head mounting structure, a second engaging position, in which the other heating surface engages ends on the bristles in said bristle bunch holder, and a rest position, which lies outside of the range of relative movement between said bristle bunch holder and said brush head mounting structure.

4,255,225

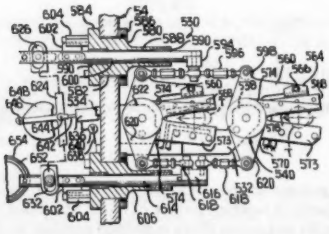
COMBINED HEAT SEALER AND CUT-OFF DEVICE

Jack R. Evers, Torrance, Calif., assignor to Developak Corporation, Redondo Beach, Calif.

Filed Sep. 17, 1979, Ser. No. 76,453

Int. Cl.[3] B32B *31/00;* B30B *5/02*

U.S. Cl. 156—515 10 Claims



1. A combined heat sealer and cut-off device for cutting a continuous tube into sections of preselected length and closing one end of each tube section, said device comprising a support bracket, a pivot carried by said support bracket, a pair of cooperating scissor blade like members pivotally mounted on said pivot and carrying cooperating heat sealing members, a blade element pivotally mounted on said pivot and cooperating with said heat sealing members to sever the tube immediately adjacent a heat sealed pinched off portion of the tube to define a tube portion with a closed end and an open end, and actuating means connected to blade like members an said blade element for pivoting the same in timed relation.

4,255,226

DEVICES FOR AIDING THE PREPARATION OF GRAPHIC ARTWORK

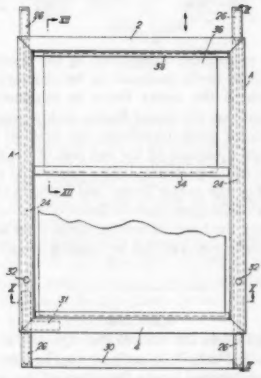
Michael E. Crofts, Kingston-Upon-Thames; Michael S. Peevers, and Eileen S. Peevers, both of Gillingham, all of England, assignors to Kew Research Limited, Kew, England

Filed Oct. 24, 1978, Ser. No. 954,074

Claims priority, application United Kingdom, Oct. 27, 1977, 44702/77

Int. Cl.[3] B44C *3/00;* B05C *13/02*

U.S. Cl. 156—541 5 Claims



1. A device for supporting and guiding a master sheet in relation to an item of artwork carried by a drawing board, the device comprising: a carrier in the form of a rectangular frame, the frame including two parallel elongated first guides, and including mounting means for detachably mounting a master sheet on the frame; intermediate guide means comprising two parallel elongated second guides, each of said second guides being in interengagement with a respective one of said first guides in a manner confining relative motion between said first guides and said second guides to relative longitudinal reciprocation parallel to a first direction; and elongated roller means, journalled in each of said second guides, for engaging the drawing board to thereby support the device with a master sheet thereon and for restraining said intermediate guide means to reciprocate parallel to the plane of the carrier relatively to the drawing board solely in a second direction perpendicular to the first direction, said first and second parallel elongated guide means comprise interengaging U-shaped channel slides.

4,255,227

APPARATUS FOR FORMING LAMINATED FABRICS

Philip R. Hill, Nuremberg, Pa., assignor to Chromatex, Inc., West Hazelton, Pa.

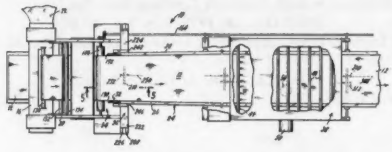
Continuation-in-part of Ser. No. 971,804, Dec. 21, 1978, Pat. No. 4,188,445, which is a continuation of Ser. No. 859,851, Dec. 12, 1977, abandoned. This application Jan. 23, 1980, Ser. No. 114,604

Int. Cl.[3] B32B *31/04*

U.S. Cl. 156—555 6 Claims

1. Apparatus for forming a laminated fabric by laminating a layer of woven olefin yarn to a layer of nonwoven olefin material comprising: a Support, a tenter frame mounted to said

support having an entry end adapted for receiving woven olefin yarn and an exit end from which the laminated fabric is conveyed; a spray section located downstream of the entry end of said tenter frame, said spray station including a spray booth having first and second compartments, said first compartment including means adopted to spray a solvent based adhesive on one surface of the woven olefin yarn and said second compartment including means for at least partially evaporating the solvent from the adhesive; a non-woven material storage positioned downstream of the spray station including a skid adapted to hold a roll of non-woven olefin material mounted



for adjustable movement transverse to the tenter frame to permit non-woven olefin material to be conveyed from the storage location to the tenter frame in alignment with the woven olefin yarn on the tenter frame, and; a bonding station having two sets of pressure rollers, the first set of pressure rollers positioned upstream of the exit end of the tenter frame and the second set of pressure rollers positioned downstream of the exit end of the tenter frame and being wider than the layer of woven olefin yarn and the layer of non-woven olefin material whereby the layer of woven olefin yarn and the layer of nonwoven olefin material can be bonded across their entire width.

4,255,228

METHOD OF GROWING QUARTZ

John R. Vig, Colts Neck, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jan. 5, 1979, Ser. No. 1,238
Int. Cl.³ C30B *7/10, 29/18*
U.S. Cl. 156—623 Q **20 Claims**

1. Method of growing quartz from a quartz seed, said method including the steps of

(a) heating the quartz seed to between about 350 degrees C. and about 570 degrees C. while applying an electric field whose component, along the Z axis of the quartz seed has a strength of about 0.5 kV/cm to about 6 kV/cm, and maintaining the quartz under those conditions at least until the current passing through the quartz has decreased to a substantially constant value as a function of time;

(b) removing the impurities which had diffused to the cathode surface of the seed; and

(c) placing the quartz seed in an autoclave and hydrothermally growing the quartz.

4,255,229

METHOD OF REWORKING PROMS

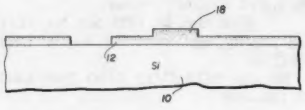
William R. Morcom, Melbourne Beach, Fla., assignor to Harris Corporation, Melbourne, Fla.

Filed Aug. 14, 1979, Ser. No. 66,592
Int. Cl.³ H01L *21/283, 21/302*
U.S. Cl. 156—628 **8 Claims**

6. A method of reworking a silicon substrate having an oxide layer thereon, aluminum connectors on said oxide layer, nichrome fuses on raised portions of said oxide layer, said raised portions of said oxide layer being heavily doped with phosphorus compared to the remainder of said oxide layer comprising:

removing said connectors and said fuses from said oxide layer;

etching said exposed oxide layer for a time sufficient to form a substantially planar oxide surface as a result of the differential etching rates of the raised portion and the remainder of the oxide layer;



forming additional oxide on said oxide layer to increase its thickness; and

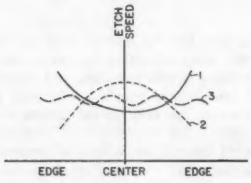
forming fuses and connectors on said oxide layer.

4,255,230

PLASMA ETCHING PROCESS

John Zajac, Santa Clara, Calif., assignor to Eaton Corporation, Cleveland, Ohio

Filed Feb. 22, 1980, Ser. No. 123,829
Int. Cl.³ H01L *21/306*
U.S. Cl. 156—643 **13 Claims**



1. A process for plasma etching polysilicon substrates comprising contacting a polysilicon substrate with:

(a) a plasma of carton tetrachloride and a plasma of a chlorinated gas, and

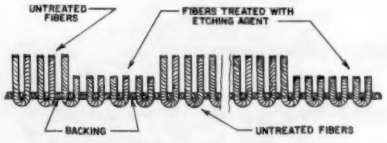
(b) a plasma of a fluorinated gas and a plasma of a chlorinated gas.

4,255,231

CARPET ETCHING

Joseph Boba, Fort Lee; Robert P. Conger, Park Ridge, and William H. Pedrick, Bound Brook, all of N.J., assignors to Congoleum Corporation, Kearny, N.J.

Continuation of Ser. No. 612,029, Sep. 10, 1975, abandoned, which is a continuation of Ser. No. 451,350, Mar. 15, 1974, abandoned. This application Jun. 13, 1979, Ser. No. 48,058
Int. Cl.³ B29C *17/08*
U.S. Cl. 156—645 **19 Claims**



1. A process for producing an etched effect on nylon pile fabric having a wearing surface of nylon fibers that comprises applying to said nylon fibers in defined areas of the surface of said pile a chemical etching agent for said fibers blended with a thickening agent to form a paste wherein said etching agent is present in a concentration sufficient to effect destruction of the portions of said fibers contacted with said paste and wherein said etching agent comprises one or more acids or acid salts having a dissociation constant stronger than acetic acid, and providing said resulting paste with a hydrogen ion concen-

tration equivalent to a pH no higher than 1, contacting said portions of said fibers remote from the base of said fabric to which said fibers are secured with said paste, and maintaining said paste in contact therewith, in an atmosphere of steam, for a period of time sufficient to destroy that portion of each of said fibers of said pile contacted by said paste to a predetermined depth remote from said base to render that part of the fibers mechanically removable.

18. A process as claimed in claim 1 for producing an etched effect on nylon pile fabric wherein the portions of each of said fibers of said pile destroyed by said paste are mechanically removed to provide an etched sculptured effect in the areas of said pile treated with said paste.

4,255,232
METHOD FOR DRYING SLUDGE

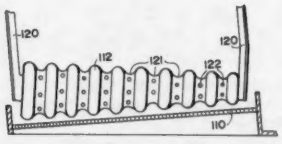
Walter Ries, Bad Mergentheim, Fed. Rep. of Germany, assignor to Braunschweigische Maschinenbauanstalt, Brunswick, Fed. Rep. of Germany

Filed Oct. 13, 1978, Ser. No. 953,191

Claims priority, application Fed. Rep. of Germany, Oct. 22, 1977, 2747506; Aug. 16, 1978, 2835916

Int. Cl.³ B01D *1/00*

U.S. Cl. 159—47 R **11 Claims**



1. A method for continuously drying pasty, aqueous sludge, comprising the steps of continuously subjecting the sludge to an intense agitation by alternately subjecting the sludge particles to intense motions to enlarge the sludge surface, and to mechanical compression to reduce the sludge surface again for substantially loosening the individual sludge particles and for repeatedly bringing different sludge particles to the surface, pressure feeding drying gas into contact with the agitated sludge for absorbing the moisture from the sludge, and removing the gas enriched with moisture from the sludge, and wherein said pressure feeding of said drying gas is performed during said sludge compression whereby the dry pressurized gases are brought into surface contact with the sludge.

4,255,233
USE OF POLYACRYLIC ACID IN PULP BLEACHING PROCESSES TO PRESERVE PULP STRENGTH AND AID IN BRIGHTNESS

Dominic S. Rende, Woodridge, and David R. Cosper, Downers Grove, both of Ill., assignors to Nalco Chemical Company, Oak Brook, Ill.

Filed Oct. 18, 1979, Ser. No. 86,239

Int. Cl.³ D21C *9/12*

U.S. Cl. 162—73 **4 Claims**

1. In a method for the chlorine bleaching of aqueous slurries of chemically produced cellulosic materials the improvement comprising maintaining in the aqueous slurry of chemically produced cellulosic materials during treatment with chlorine bleaching agent from 0.05–0.5% by weight of polyacrylic acid or its water-soluble alkali metal or ammonium salts based on the dry weight of cellulosic material in said aqueous slurry whereby a cellulosic material having improved brightness and fiber strength is obtained.

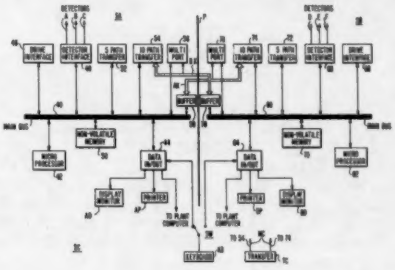
4,255,234
AUTOMATIC FLUX MAPPING SYSTEM

James A. Neuner, Gibsonia, and Robert M. Oates, Murrysville, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Oct. 12, 1978, Ser. No. 950,650

Int. Cl.³ G21C *17/00*

U.S. Cl. 176—19 R **5 Claims**



1. In a nuclear reactor flux mapping system for developing a reactor flux map on the basis of flux measurement information from movable in-core detectors which probe flux thimbles of a reactor core, the combination of,

at least a first and second group of movable in-core flux measuring detectors,

first and second multi-path transfer mechanisms operatively associated with said first and second group of detectors respectively, said multi-path transfer mechanisms mechanically directing the detectors to the flux thimbles to be probed by the detectors,

a partitioned electronics system including:

(a) a first subsystem operatively connected to said first multi-path transfer mechanisms for controlling the positioning of said first group of detectors within a first set of flux thimbles to probe said thimbles and generate information corresponding to a first portion of said flux map,

(b) a second subsystem operatively connected to said second multi-path transfer mechanisms controlling the positioning of said second group of detectors within a second set of flux thimbles to probe said thimbles and generate information corresponding to a second portion of said flux map,

(c) a memory means associated with each of said subsystems, each memory means including as stored information the information corresponding to the detector positions within both said first and second set of flux thimbles to derive said first and second portions of said flux map,

buffered circuit means operatively coupling said first and second subsystems while isolating each subsystem from fault conditions in the other subsystem,

control means connected to said buffered circuit means such that one subsystem may be selected to probe both the first and second set of flux thimbles with the group of detectors associated with the selected subsystem thereby providing the capability of developing said flux map by the detectors of one of said subsystems in the event of a malfunction of the other of said subsystems,

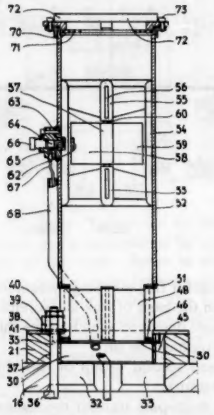
means for generating a transfer signal to select said first or second subsystem to generate flux measuring information corresponding to both said first and second portions of said flux map, and communications means connected to said buffered circuit means to provide data communications between said first and second subsystems to make available status information of the flux mapping operation of each subsystem available to the other subsystem to coordinate. The operation of the subsystems.

4,255,235

DEVICE FOR MEASURING THE FLOW RATE OF COOLING FLUID AT THE INLET OF THE CORE OF A WATER-COOLED REACTOR

Michel Dubourg, Le Mesnil St. Denis, France, assignor to Framatome, Courbevoie, France

Filed Dec. 28, 1978, Ser. No. 974,510
Claims priority, application France, Dec. 29, 1977, 77 39549
Int. Cl.[3] G21C *17/00*
U.S. Cl. 176—19 R 6 Claims



1. A removable device for measuring the flow rate of cooling fluid entering the core of a water-cooled nuclear reactor during tests before putting the reactor into operation, said reactor comprising a pressure-resistant vertical cylindrical vessel having at least one inlet and at least one outlet for cooling fluid and between which the cooling fluid flows in contact with fuel elements forming the reactor core during part of its travel where the fluid moves vertically upwards, a top core plate and a bottom core plate formed with apertures for the flow of said cooling fluid, the fuel elements and a bearing structure being disposed between said core plates and the bearing structure being disposed at the top part of the vessel for securing a cylindrical shroud open at its lower part coaxial with the vessel, disposed inside the vessel and surrounding the full extent of the reactor core, the vessel and the shroud being separated by a space having an annular cross-section and connected to the inlet for the cooling fluid, the cooling fluid outlet communicating with the inner part of the shroud containing the core, said removable device comprising

a bearing and securing base adapted to be removably secured to the bottom core plate so as to replace a fuel element, the core being empty of fuel elements during the tests and defining a central aperture for communicating with at least one aperture in the bottom core plate,

a vertical cylindrical casing called a measuring chimney secured at its lower end to said base and comprising a diaphragm at its upper end for adjusting the pressure drop in the device, the inner portion of which communicates with the aperture in the base,

a bearing structure secured to the interior of said measuring chimney,

two bearings disposed along the axis of said chimney and mounted on said bearing structure,

a propeller comprising two blades of non-magnetic material and coaxial with the chimney and rotatable in said bearings mounted on said bearing structure,

an element made of magnetic material provided on one of said propeller blades,

a horizontal axis measuring coil mounted on said chimney at the level of said magnetic element secured to said one propeller blade, said coil being insulated from cooling fluid flowing in said chimney and being connected so as to be supplied with direct current to produce current pulses at the moment when said magnetic element moves in front of said coil when said propeller is rotated by cooling fluid flowing in said chimney, and

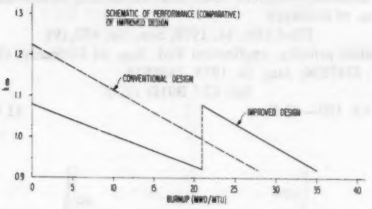
a frequency-measuring device connected by a cable to said coil.

4,255,236

REACTOR AND FUEL ASSEMBLY DESIGN FOR IMPROVED FUEL UTILIZATION IN LIQUID MODERATED THERMAL REACTORS

Thomas R. Robbins, 1528 Crofton Pkwy., Crofton, Md. 21144

Filed Nov. 1, 1977, Ser. No. 847,524
Int. Cl.[2] G21C *7/00, 7/30, 19/20*
U.S. Cl. 176—20 SS 12 Claims



1. A method of operating a liquid moderated thermal reactor which does not rely upon D_2O to shift the neutron spectrum which comprises:

(a) initially irradiating at least a portion of the fuel assemblies in the core of the reactor in an undermoderated condition, said fuel assemblies being uranium fuel assemblies enriched with fissile uranium material and comprising a plurality of fuel rods, and said undermoderated condition resulting in increased production of fissile plutonium with reduced uranium burn-up which increases the degree of undermoderation during said irradiation, and

(b) after irradiation for from $\frac{1}{4}$ to $\frac{3}{4}$ of the normal operating lifetime of the fuel assemblies, withdrawing a fraction of the fuel rods from said undermoderated fuel assemblies such that the hydrogen-to-fuel ratio for said assemblies is nearer the optimum moderated condition for the fuel composition at the time of fuel rod removal and the neutron spectrum is shifted to a lower level.

4,255,237

METHOD FOR PRODUCING A NOZZLE BODY BY ELECTROFORMING

Wolfgang Obert, and Siegfried Dürr, both of Karlsruhe, Fed. Rep. of Germany, assignors to Kernforschungszentrum Karlsruhe Gesellschaft mit beschränkter Haftung, Karlsruhe, Fed. Rep. of Germany

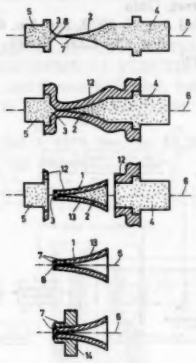
Filed Jul. 2, 1979, Ser. No. 55,199
Claims priority, application Fed. Rep. of Germany, Jul. 1, 1978, 2828993
Int. Cl.[3] C25D *1/02, 1/20*
U.S. Cl. 204—9 9 Claims

1. A method for producing a nozzle body for generating a cluster beam or focusing corpuscular radiation, comprising the steps of:

(a) fabricating a base body having the negative shape of the nozzle body to be produced, by providing a plurality of separately produced parts each having an axially symmetrical outer surface, providing in one of the parts of the base body a bore coaxial with its axis of symmetry, providing another of the parts of the base body with a tip which tapers progressively to its end, and mounting the tip of the

other part centrally in the bore of the one part to place the parts in axial alignment and form the base body;

(b) electrolytically depositing a metal layer on the outer



surface of the resulting base body to form the nozzle body; and

(c) removing the plurality of parts of the base body from the nozzle body.

4,255,238

METHOD OF CONTROL FOR AN ELECTROLYTIC DISPLAY CELL AND ESPECIALLY A CELL OF THE METAL HALIDE TYPE AND A CIRCUIT FOR THE APPLICATION OF SAID METHOD

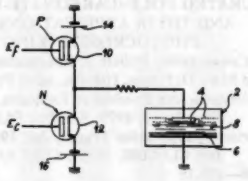
Gilles Delapierre, Seyssinet, and Robert Meyer, Saint Ismier, both of France, assignors to Commissariat A. l'Energie Atomique, Paris, France

Filed Jun. 13, 1979, Ser. No. 48,222

Claims priority, application France, Jun. 19, 1978, 78 18223

Int. Cl.³ C25D *19/00, 25/00*

U.S. Cl. 204—18.1 **5 Claims**



1. A method of control of an electrolytic display cell in which said cell comprises a plurality of electrodes having shapes suited to the display of characters, a counter-electrode and an electrolyte, in which a negative voltage is applied to one of the electrodes in order to initiate writing on said electrode and a positive voltage pulse is applied to said electrode in order to initiate erasure and in which the voltage between said electrode and said counter-electrode on completion of erasure has a tendency to rise to a threshold value corresponding to the production of a parasitic reaction, wherein the end of the erasure pulse is determined by the instant at which the electrode—counter-electrode voltage rises to the threshold voltage corresponding to the production of a parasitic reaction.

4,255,239

METHOD FOR MAKING TINNED STEEL PLATE FREE FROM SURFACE GRAPHITE

Everhardus N. Soepenberg, Castricum, Netherlands, assignor to Hoogovens IJmuiden BV, IJmuiden, Netherlands

Continuation of Ser. No. 932,401, Aug. 9, 1978, abandoned, which is a continuation of Ser. No. 834,066, Sep. 16, 1977, abandoned, which is a continuation of Ser. No. 740,057, Nov. 8, 1977, abandoned, which is a continuation of Ser. No. 583,170, Jun. 3, 1975, abandoned. This application Jun. 25, 1979, Ser. No. 51,398

Claims priority, application Netherlands, Jun. 5, 1974, 7407528

Int. Cl.³ C25D *5/26, 5/36*

U.S. Cl. 204—28 **9 Claims**

1. In a method for the prevention of the formation of surface graphite on a steel strip from which the graphite originates out of the steel itself and upon which a metal coating layer is applied which includes the steps of

(a) cold rolling a hot-rolled steel strip,

(b) cleaning the cold rolled strip by means of an electrolysis bath to remove any carbonaceous material attached thereto,

(c) rinsing the cleaned strip,

(d) tightly coiling or packing the rinsed strip, annealing it and skin-passing it, and

(e) electrolytically applying the said metal coating layer,

the improvement which comprises in said rinsing step (c) or subsequently thereto, passing said strip through a bath which contains, in a suitable amount, a conditioning substance selected from the group consisting of urea, thiosemicarbazide, and a mixture of such substances which is preferentially adsorbed on the surface of the strip and which in the annealing hinders or prevents the formation of surface graphite by the carbon within the steel.

4,255,240

ION-EXCHANGE STRUCTURES OF COPOLYMER BLENDS

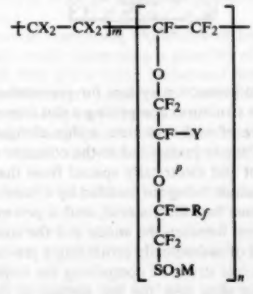
Charles J. Molnar, Wilmington, Del.; Edward H. Price, Kennett Square, Pa., and Paul R. Resnick, Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 886,338, Mar. 13, 1978, Pat. No. 4,176,215. This application Jun. 4, 1979, Ser. No. 45,413

Int. Cl.³ C25B *1/46*

U.S. Cl. 204—98 **4 Claims**

1. An electrolytic cell comprising a housing with separate anode and cathode compartments, said compartments separated by an ion exchange film or membrane of a blend of 10 to 90% by wt. of a first fluorinated polymer which has repeating units



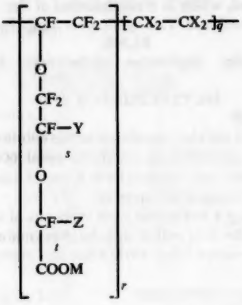
where

m is 3 to 15,

n is 1 to 10,

p is 0, 1 or 2,

the X's taken together are four fluorines or three fluorines and one chlorine,
Y is F or CF_3,
R_f is F, Cl or a C_1 to C_{10} perfluoroalkyl radical, and
M is H or alkali metal, and 90 to 10% by wt. of a second fluorinated polymer which has repeating units



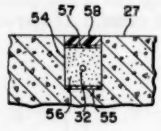
where
q is 3 to 15,
r is 1 to 10,
s is 0, 1 or 2,
t is 2,
The X—s taken together are four fluorines or three fluorines and one chlorines,
Y is F or CF_3,
Z is F or CF_3, and
M is H or alkali metal.

4,255,241

CATHODIC PROTECTION APPARATUS AND METHOD FOR STEEL REINFORCED CONCRETE STRUCTURES

David H. Kroon, 300 E. Roberts La., Wood Dale, Ill. 60191; James B. Bushman, 6395 Kennard Rd., and Joseph W. Rog, 2951 Plum Creek Pkwy., both of Medina, Ohio 44256

Filed May 10, 1979, Ser. No. 37,632
Int. Cl.³ C23F *13/00*
U.S. Cl. 204—147 34 Claims



1. A cathodic protection system for pre-existing steel reinforced concrete structures comprising a slot formed in the top concrete surface of such structure, a thin elongate corrosion resistant, metal anode juxtaposed to the concrete of the structure in such slot and electrically spaced from the steel of the structure, said anode being surrounded by a matrix of conductive carbonaceous backfill material, and a power source impressing a current between the anode and the steel.

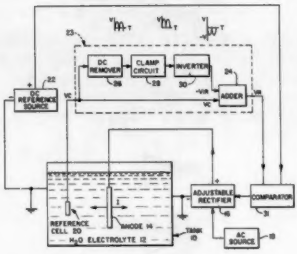
18. A method of cathodically protecting a pre-existing metal reinforced concrete structure comprising the steps of strategically positioning slots near the top surface of the structure, positioning elongated corrosion resistant, metal wire or rod anodes adjacent the concrete in such slots in a matrix of carbonaceous backfill material, and impressing a protective current flow from the anodes.

4,255,242

REFERENCE ELECTRODE IR DROP CORRECTOR FOR CATHODIC AND ANODIC PROTECTION SYSTEMS

Jonathan P. Freeman, Dorset, Ohio, assignor to Freeman Industries, Inc., Dorset, Ohio

Filed Aug. 9, 1979, Ser. No. 65,226
Int. Cl.³ C23F *13/00*
U.S. Cl. 204—147 23 Claims



1. A system to protect a structure immersed in an electrolyte comprising:
means to apply a rectified alternating current voltage between the structure and an electrode which is immersed in the electrolyte and spaced apart from the structure;
a reference cell located in the electrolyte to produce a direct current voltage between the reference cell and the structure; and
means coupled to the reference cell to measure the potential produced by the reference cell between the reference cell and the structure, said measuring means including means to separate out any alternating current voltage component of the rectified alternating current voltage induced at the reference cell by a current flowing between the electrode and the structure from a direct current voltage component produced by the reference cell between the cell and the structure, and output means to provide only the direct current voltage component as the output of said measuring means to indicate the potential of the structure to be protected without interference from a voltage produced by the current flow between the electrode and the structure.

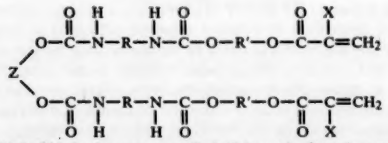
4,255,243

UNSATURATED POLY-(CARBONATE-URETHANES) AND THEIR APPLICATIONS TO PHOTOCROSSLINKING

Annick G. Coqueugniot; Robert J. Bruggeman, both of Ballancourt, and Marc D. Piteau, Itteville, all of France, assignors to Societe Nationale des Poudres et Explosifs, Paris, France

Filed Jul. 2, 1979, Ser. No. 54,147
Claims priority, application France, Jul. 19, 1978, 78 21456
Int. Cl.³ C08L *75/04*; C08F *8/14*
U.S. Cl. 204—159.15 7 Claims

1. The compounds poly-(carbonate-urethanes) with acrylic unsaturations, of the formula



in which: X is hydrogen or methyl, R is a substituted or unsubstituted alkylene, cycloalkylene or arylene radical, R' is a lower alkylene radical, Z is a polycarbonate chain originating from a hydroxytelechelating, aliphatic or cycloaliphatic, linear

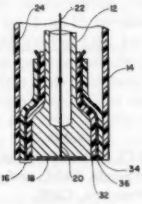
polycarbonate having a molecular weight of between 500 and 3,000 and C,H,N and O respectively are carbon hydrogen, nitrogen and oxygen.

4,255,244

SHRINK TUBE LIQUID JUNCTION STRUCTURE FOR ELECTROCHEMICAL ELECTRODES

George Matsuyama, and Grover F. Lindell, both of Santa Ana, Calif., assignors to Beckman Instruments, Inc., Fullerton, Calif.

Filed Jul. 6, 1979, Ser. No. 55,253
Int. Cl.[3] G01N *27/30*
U.S. Cl. 204—195 F **8 Claims**



6. In an electrochemical electrode comprising a hollow container and an electrolyte reservoir therein, an improved liquid junction structure closing an opening in the hollow container for establishing electrolytic communication between electrolyte in the reservoir and a test solution comprising:

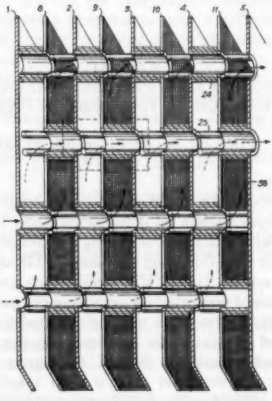
an element of capillary material restrained between first and second plastic shrink tubes and as thus restrained extending therethrough from a point contacting the electrolyte to a point for contacting the test solution.

4,255,245

ELECTROLYSIS CELLS

Jacques Maire, Epinay-sur-Seine, and Gerard Pere, Le Breuil, both of France, assignors to Creusot-Loire, Paris, France

Filed Jul. 17, 1979, Ser. No. 58,183
Claims priority, application France, Aug. 22, 1978, 78 24329
Int. Cl.[3] C25B *9/00, 15/08*
U.S. Cl. 204—257 **13 Claims**



1. An electrolysis cell comprising:

an alternate series of electrodes and a diaphragm means which are parallel and separated from each other by spaces for circulation of an electrolyte;

inlets for electrolyte in one face of said cell and which extend parallel to said electrodes;

outlets for electrolyte in another face of said cell opposite and parallel to said one face;

a rectilinear inlet channel in respect of each said inlet, each said inlet being contiguous with the corresponding, said inlet channel, each said inlet channel extending perpendicular to said electrodes through said cell to said other face which obstructs it;

a rectilinear outlet channel in respect of each said outlet, each said outlet being contiguous with the corresponding said outlet channel, each said outlet channel extending perpendicular to said electrodes through said cell to said one face which obstructs it;

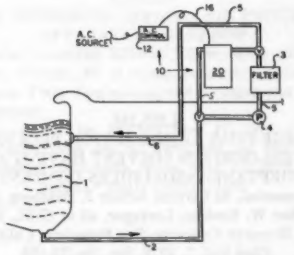
passages located between said electrodes and said diaphragm means and connecting said inlet channels to said outlet channels, said ones of said passages connected to one said inlet alternating with said one of said passages connected to another of said inlets such that said passage located between a said electrode and the adjacent said diaphragm means is connected to said one inlet and said passage located between said diaphragm means and the next adjacent said electrode is connected to said other inlet channel such that in use said one passage can be traversed by an electrolyte of one polarity and said other passage can be traversed by an electrolyte of other polarity.

4,255,246

ELECTROLYTIC CELL FOR CHLORINE PRODUCTION

David W. Davis, 100 Tico Rd., Titusville, Fla. 32780, and Donald F. Helenthal, 380 Sherwood Ave., Satellite Beach, Fla. 32937

Filed Jan. 29, 1979, Ser. No. 7,340
Int. Cl.[3] C25B *9/00, 1/24, 11/02, 15/02*
U.S. Cl. 204—228 **16 Claims**



1. An electrolytic cell for making hypochlorous acid (HClO) by the electrolysis of an aqueus chloride solution, comprising in combination:

a first electrode comprising a plurality of first wires, and a second electrode comprising a plurality of second wires, with said first wires being juxtaposed with said second wires so as to form a passageway for enabling the flow of the chloride solution therebetween;

a first frame having spaced first and second supports, with said first wires being wound between said first and second supports;

a second frame having a third support coupled over said first wires to said first support, and a fourth support coupled over said second wires to said second support, with said second wires being wound between said third and fourth supports;

a housing for carrying said first and said second electrodes therewithin; and

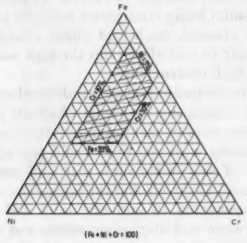
electrical means for impressing an electrical potential of opposing polarity onto said first and said second electrodes, thereby enabling the electrolysis of the chloride solution therebetween.

4,255,247

ELECTRODE

Yoshio Oda; Hiroshi Otouma, and Eiji Endoh, all of Yokohama, Japan, assignors to Asahi Glass Company, Limited, Tokyo, Japan

Filed Feb. 21, 1978, Ser. No. 879,751
Claims priority, application Japan, Feb. 18, 1977, 52-16122
Int. Cl.[3] C25B *11/06, 1/46*
U.S. Cl. 204—293 31 Claims



1. An electrode prepared by etching at least a portion of a first metallic component from an alloy substrate which alloy comprises a first metallic component selected from the group consisting of chromium, manganese, tantalum, niobium, vanadium, titanium, silicon, zirconium, germanium, scandium, yttrium and lanthanum and a second metallic component selected from the group consisting of iron, nickel, tungsten, copper, silver, cobalt and molybdenum, wherein said alloy comprises 1 to 30 wt.% of the first metallic component and 99 to 70 wt.% of the second metallic component, and wherein said etching is sufficient to form 10^3 to 10^8 per cm^2 pores of average depths of 0.01 to 50μ on the surface of the substrate.

4,255,248

TWO-STAGE COAL LIQUEFACTION PROCESS WITH PROCESS-DERIVED SOLVENT HAVING A LOW HEPTANE-INSOLUBILES CONTENT

Joel W. Rosenthal, El Cerrito; Arthur J. Dahlberg, Pinole, and Christopher W. Kuehler, Larkspur, all of Calif., assignors to Chevron Research Company, San Francisco, Calif.

Filed Sep. 7, 1979, Ser. No. 73,156
Int. Cl.[3] C10G *1/00*
U.S. Cl. 208—8 LE 8 Claims

1. A process for liquefying coal which comprises:

forming a coal-solvent slurry by mixing subdivided coal with a solvent;

passing said slurry with added hydrogen through a dissolving zone free of externally supplied catalyst and contact particles at a temperature in the range 425°–480° C. to substantially dissolve said coal to produce a first effluent;

contacting at least a portion of said first effluent from said dissolving zone in a reaction zone containing hydrocracking catalyst under hydrocracking conditions, including a temperature in the range of 340°–400° C. and a pressure in the range of 70–205 atmospheres to produce a second effluent, having a normally liquid portion containing heptane-insolubles;

cooling at least a portion of said normally liquid portion of said second effluent to precipitate substantially all of said heptane-insolubles; and

recycling at least a portion of the cooled, substantially heptane-insoluble-free, liquid portion for use as coal solvent.

4,255,249

PROCESS FOR PRODUCTION OF OIL FROM OIL SAND

Ichiro Shibanai; Kouki Horikoshi, both of Tokyo, and Nobuyuki Nakamura, Kunitachi, all of Japan, assignors to Kyoshin Co., Ltd., Tokyo, Japan

Filed Jun. 22, 1979, Ser. No. 50,990
Claims priority, application Japan, Apr. 5, 1979, 54-40304
Int. Cl.[3] C10G *1/00*
U.S. Cl. 208—11 R 1 Claim

1. A process for the production of oil from oil sand, characterized by adding cyclodextrin or a starch decomposition product containing cyclodextrin to oil sand to convert petroleum in the oil sand to an inclusion compound and separating and collecting petroleum from said inclusion compound.

4,255,250

EXTENDED CYCLE REGENERATIVE REFORMING

Charles S. McCoy, Orinda, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed May 23, 1979, Ser. No. 41,967
Int. Cl.[3] C10G *35/04, 35/08*
U.S. Cl. 208—64 8 Claims

1. In a reforming process wherein a naphtha feedstock is contacted at reforming conditions in the presence of hydrogen with a reforming catalyst in a plurality of reaction zones in series, a product of improved octane rating is recovered from the effluent of the last reaction zone, and during the course of said reforming coke deposits upon said catalyst thereby deactivating said catalyst and necessitating eventual regeneration or replacement thereof, the method of extending the length of service of the catalyst in all reaction zones downstream of the first which comprises maintaining the level of coke on the catalyst in said first reaction zone at less than 1% by weight by adjusting the frequency at which the catalyst in said first reaction zone is regenerated or replaced with fresh or regenerated catalyst.

4,255,251

HYDROCRACKING PROCESS AND CATALYST

Joseph A. Durkin, Groves, Tex., assignor to Texaco Inc., White Plains, N.Y.

Filed Jul. 30, 1979, Ser. No. 61,733
Int. Cl.[3] C10G *47/20*
U.S. Cl. 208—108 10 Claims

1. In a process for hydrocracking petroleum charge stocks wherein a hydrocarbon oil is contacted under hydrocracking conditions with a catalyst comprising a hydrogenating component selected from the group consisting of Group VIII metals, Group VI metals, Group VII metals, their compounds and mixtures thereof supported on a cracking component comprising an acidic solid contact material selected from the group consisting of alumina, silica, magnesia, zirconia, and beryllia, mixtures and composites thereof, the improvement which comprises contacting said catalyst with a mixture of gases comprising sulfur dioxide, water vapor, and oxygen at a temperature within the range of 200° to 425° C. for a period of time within the range of 2 to 24 hours and thereafter contacting said catalyst under hydrocracking conditions in the presence of added hydrogen with said hydrocarbon oil charge stock.

4,255,252

PROCEDURE FOR THE REPROCESSING OF USED LUBRICATING OILS

Helmut Knorre, Seligenstadt; Manfred Langer, Karlstein, and Gerhard Pohl, Hanau, all of Fed. Rep. of Germany, assignors to Deutsche Gold und Silber-Scheideanstalt Vormals Roessler, Frankfurt am Main, Fed. Rep. of Germany

Filed Mar. 22, 1979, Ser. No. 23,059

Claims priority, application Fed. Rep. of Germany, Mar. 25, 1978, 2813200

Int. Cl.³ C10M *11/00*

U.S. Cl. 208—182 7 Claims

1. A process for the reprocessing of used lubricating oils by treating dried oil with finely dispersed sodium metal at an elevated temperature and subsequent separation of the treated product by distillation, the improvement consisting essentially of the oil being treated for 1 to 15 minutes at temperatures between 50° and 200° C. with 0.3 to 3.0% by weight of sodium, wherein the sodium has an average particle diameter of at most 100 μm, the remaining free and/or organically bound metal being then decomposed by means of fluid water in the amount of 0.1 to 2.0% by weight and after that the oil is distilled, said improvement eliminating the need for a preliminary purification step, mechanical removal of residual metal and an after treatment step.

4,255,253

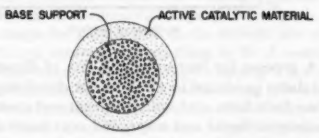
HYDROGEN PROCESSING OF HYDROCARBON FEEDS USING COATED CATALYSTS

Daniel R. Herrington, Chesterland; Albert P. Schwerko, Solon; Serge R. Dolhyj, Parma, and Wilfrid G. Shaw, Lyndhurst, all of Ohio, assignors to The Standard Oil Company, Cleveland, Ohio

Filed Jan. 3, 1979, Ser. No. 844

Int. Cl.³ C10G *45/08*

U.S. Cl. 208—216 PP 14 Claims



1. In the process of hydrogen processing of hydrocarbon feedstocks by contacting the hydrocarbon feedstock and hydrogen at an elevated temperature with a hydrocarbon processing catalyst, the improvement comprising using as at least a part of the catalyst a coated catalyst prepared by:

(a) contacting a base support of at least about 20 microns in diameter with an excess of liquid in such a manner that the liquid is absorbed by the support to produce a wet support,

(b) drying said wet support to provide a partially wet support,

(c) contacting the partially wet support with a powder of an active catalytic material, and

(d) gently agitating the mixture of the partially wet support and active catalytic material to produce the catalyst.

4,255,254

DELAYED COUNTERWEIGHT VIBRATOR APPARATUS

Elbert R. Faust, Litchfield, Conn., and Stuart F. Faunce, Fanwood, N.J., assignors to Faunce and Associates, Inc., Fanwood, N.J.

Filed Nov. 19, 1979, Ser. No. 95,431

Int. Cl.³ B07B *1/44*; B65G *27/20*

U.S. Cl. 209—329 10 Claims

1. An apparatus for vibrational conveyance, comprising:

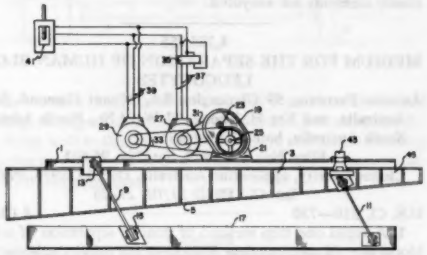
(a) a frame;

(b) a trough connected to said frame;

(c) a plurality of leaf-springs, each leaf-spring supported said frame at one end and fixedly located at the other end, said leaf-springs having only one degree of freedom;

(d) bearings mounted on said frame;

(e) means journaled in said bearings to transmit primary forces to said frame to impart motion thereto, said means including a plurality of eccentric counterweights being of equal masses and identical shapes with respect to their axes of rotation;



(f) a plurality of motors mounted on said frame adapted to independently rotate said counterweights at equal but opposite rotational velocities; and

(g) a time delay relay circuit connected to said plurality of motors operable so as to delay starting of one or more motors so as to cause said counterweights to start in a sequential manner and to thereby rotate said counterweights at a predetermined, synchronized phase angle.

4,255,255

TUBULAR MEMBRANE SEPARATION PROCESS AND APPARATUS THEREFOR

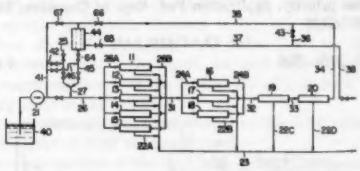
Toshio Ogawa, Takahagi; Katsuya Ebara, Mito, and Sankichi Takahashi, Hitachi, all of Japan, assignors to Hitachi, Ltd. and Hitachi Plant Engineering and Construction Co., Ltd., both of, Japan

Continuation of Ser. No. 667,589, Mar. 17, 1976, abandoned. This application Apr. 13, 1978, Ser. No. 895,979

Claims priority, application Japan, Mar. 22, 1975, 50-33534

Int. Cl.² B01D *31/00, 13/00*

U.S. Cl. 210—652 15 Claims



6. In a tubular membrane separation process which includes surrounding tubular semipermeable membranes by liquid-permeable support members to provide modules, arranging a plurlity of units of said modules in a manner such that the modules are connected together in multiple stages ranging from a stage at which a solution to be treated has a lower concentration to a stage at which the solution has a higher concentration, feeding said solution to the interior of said tubular semipermeable membranes, and collecting a liquid that has passed through the membranes under pressure while taking out a concentrated solution from the interior of the tubular membranes, the improvement comprising the steps of forcing a plurality of elastic elements, together with the solution to be treated, through the tubular semipermeable membranes, the

solution being forced to flow through the modules continuously in a predetermined direction in a constant flow condition and the elastic elements being continuously recycled in the predetermined direction of flow of the solution without disturbing the constant flow condition of the solution, whereby said elastic elements continuously clean said membranes while said membranes continuously treat said solution to concentrate said solution, separating the used elastic elements from the concentrated solution to store the elastic elements in a collector, and then supplying the elastic elements in the collector to the upstream side of the modules together solely with a fresh quantity of the solution from a solution source, whereby the elastic elements are recycled.

4,255,256

MEDIUM FOR THE SEPARATION OF HUMAN BLOOD LEUCOCYTES

Antonio Ferrante, 59 Gleneagles Rd., Mount Osmond, South Australia, and Yee H. Thong, 27 Ward St., North Adelaide, South Australia, both of Australia

Filed Nov. 23, 1979, Ser. No. 96,661

Claims priority, application Australia, Dec. 13, 1978, PD7101

Int. Cl.³ B01D *21/01, 21/26*

U.S. Cl. 210—730 **8 Claims**

1. A rapid one step method of density separation of whole blood into (i) mononuclear leucocyte (ii) polymorphonuclear leucocyte and (iii) erythrocyte fractions wherein

a whole blood sample is layered onto an aqueous separating medium in a centrifuge tube and the blood sample and separating medium centrifuged so that the whole blood sample is fractionalised into the fractions hereinabove, wherein the separating medium consists of a mixture of (a) an aqueous solution of an erythrocyte aggregating or clumping agent being a high molecular weight sucrose or glucose polymer and (b) a solution of a water soluble metrizoate- or diatrizoate- compound of relatively high density and relatively low viscosity and osmolarity,

wherein (i) the density of the solution mixture (a) and (b) is greater than 1.095 gm/ml at room temperature, and (ii) the concentration of (a) lies in the range of 5 to 11% (based on the weight per total volume of solution mixture).

4,255,257

PROCESS FOR THE TREATMENT OF WATER

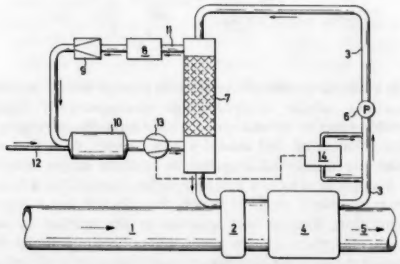
Günther Greiner; Wolfgang Grünbein, both of Liederbach, and Erhard Albrecht, Düsseldorf, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft and Messer Griesheim GmbH, both of Frankfurt am Main, Fed. Rep. of Germany

Filed Dec. 10, 1976, Ser. No. 749,437

Claims priority, application Fed. Rep. of Germany, Dec. 13, 1975, 2556328

Int. Cl.³ C02F *1/78*

U.S. Cl. 210—709 **4 Claims**



1. In a process for treatment of water containing nitrogen wherein water contaminants are oxidized and their flocculation is improved by enriching a partial current of the untreated water with an oxygen-ozone mixture in a pressurized packed column, mixing the partial current with the untreated water for treatment thereof and recycling undissolved oxygen from the column as cycle oxygen to an ozonizer, the improvement which comprises adjusting the operating pressure of the column in response to the nitrogen content of the untreated water so that the nitrogen degassing from the partial current of water in the packed column is contained in the oxygen recycled to the ozonizer for optimum operation thereof.

4,255,258

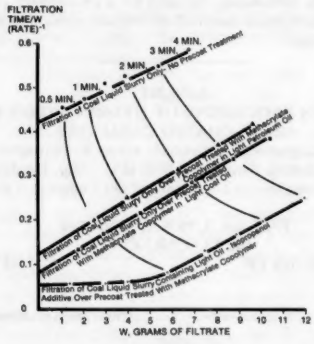
FILTRATION OF A COAL LIQUID SLURRY USING AN ALKYLMETHACRYLATE COPOLYMER AND AN ALCOHOL

Norman L. Carr, Allison Park, and Edgar L. McGinnis, Gibsonia, both of Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa.

Filed May 7, 1979, Ser. No. 36,856

Int. Cl.³ B01D *37/02;* C10G *1/04*

U.S. Cl. 210—727 **33 Claims**


FILTRATION TIME/W (RATE)⁻¹
0.6
0.5
0.4
0.3
0.2
0.1
0
0.5 MIN.
1 MIN.
2 MIN.
3 MIN.
4 MIN.
Filtration of Coal Liquid Slurry Only - No Precoat Treatment
Filtration of Coal Liquid Slurry Over Precoat Treated With Methacrylate Copolymer in Light Petroleum Oil
Filtration of Coal Liquid Slurry Over Precoat Treated With Methacrylate Copolymer in Light Coal Oil
Filtration of Coal Liquid Slurry Containing Light Oil + Isopropanol Additive Over Precoat Treated With Methacrylate Copolymer
1 2 3 4 5 6 7 8 9 10 11 12
W, GRAMS OF FILTRATE

1. A process for increasing the rate of filtration of a coal liquid slurry produced in a process for dissolving hydrocarbonaceous fuels from coal with a solvent and containing hydrocarbonaceous liquid and suspended coal minerals comprising adding to said coal liquid slurry an alkylmethacrylate copolymer and an alcohol containing 2 to 10 carbon atoms which forms a homogeneous composition in said coal slurry, and then filtering said slurry.

17. A process for increasing the rate of filtration of a coal liquid slurry produced in a process for dissolving hydrocarbonaceous fuels from coal with a solvent and containing hydrocarbonaceous liquid and suspended coal minerals comprising depositing a precoat cake of filter aid on a filter element, passing a solution of alkylmethacrylate copolymer in hydrocarbonaceous oil through said precoat cake, adding to said coal liquid slurry an alcohol containing 2 to 10 carbon atoms which forms a homogeneous composition in said coal liquid slurry, and filtering said slurry through said precoat cake.

4,255,259

SCALE INHIBITION

Chih M. Hwa, Palatine, and Dionisio G. Cuisia, Chicago, both of Ill., assignors to Chemed Corporation, Cincinnati, Ohio

Continuation-in-part of Ser. No. 915,713, Jun. 15, 1978, abandoned. This application Sep. 18, 1979, Ser. No. 76,810

Int. Cl.³ C02F *5/14*

U.S. Cl. 210—699 **9 Claims**

1. Method of inhibiting scale in a boiler water system comprising maintaining in said system about 0.2–50 ppm of a composition which consists essentially of (a) a member selected of the group consisting of copolymers of styrene sulfonic acid and maleic anhydride or maleic acid, and water soluble salts of said

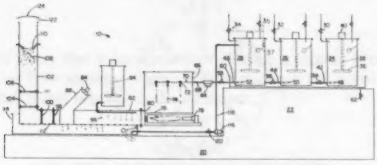
copolymers, the styrene sulfonic acid moiety in said copolymer being about 50–95 wt. % and the molecular weight of the copolymers being about 1500–6000 and (b) a member selected from a group consisting of a water soluble phosphonic acid and its water soluble salts; the weight ratio of copolymer to phosphonic acid being about 0.3–4:1.

4,255,260

WASTE DISPOSAL SYSTEM

Samuel T. Romeo, 1926 Middleborough Rd., Baltimore, Md. 21221

Filed Dec. 10, 1979, Ser. No. 101,831
Int. Cl.³ B01D *35/00*
U.S. Cl. 210—121 **1 Claim**



1. A system for waste disposal comprising: means for charging waste with water, means for progressively causing the waste charged with water to explode, including: a chamber, a hot surface in the bottom of the chamber; means for spraying the waste charged with water downward onto the hot surface and explosively vaporizing same; means for spraying the vapor with a chemical treatment; first means for filtering the chemically treated vapor and gravitationally removing any filtrate resulting from same, second means for filtering the chemically treated vapor against a counterflow wash of water and means for exhausting the water-washed vapor into the atmosphere, the means for charging including at least one tank, mixing means in the tank, means for introducing water and waste into the at least one tank, means for recycling said filtrate together with any unused chemical sprayed and water sprayed comprising a trough beneath a portion of said system with opening into the trough, means for pumping from the trough into said at least one tank and means for controlling level of material in said trough, the means for exhausting including a horizontal duct at said chamber and the chamber being substantially closed to outward passage of material therefrom except for an opening into the duct, causing pressure of said vaporizing to move vapor from the chamber, the means for exhausting further including fan means having connection with the duct for forcing air thereinto at an oblique angle away from said chamber, the means for gravitationally removing comprising said first means for filtering being vertically oriented and above said trough; an upward duct having serial connection with said horizontal duct, the second means for filtering the chemically treated vapor against a counterflow of water comprising said second filtering means being horizontally oriented in said upward duct and means above said second means for filtering spraying water downwardly thereonto, said first and second means for filtering having means for sliding for cleaning and replacement, a safety catch-basin beneath said at least one tank having at least the capacity of said at least one tank, and means for controlling the level of waste and water in said at least one tank.

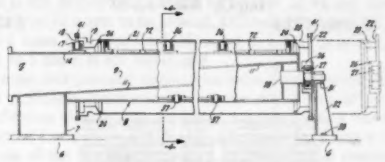
4,255,261

SEPARATION DRUM FOR BELT FILTER WITH SUCTION RECOVERY OF SOLIDS

Joseph C. Dodd, 2 Meng Suan Rd., Singapore 26, Singapore

Filed Apr. 11, 1979, Ser. No. 29,266
Int. Cl.³ B01D *37/02*
U.S. Cl. 210—193 **8 Claims**

1. A belt filter with suction recovery of the solids trapped on the belt by means of a separation drum assembly comprising a base; a substantially horizontal cantilever beam mounted on said base, said beam being substantially hollow and open at one end; a horizontal separation drum having a relatively thin, perforate wall encompassing said beam and extending for substantially the entire length thereof; means for at least partly supporting said separation drum on said beam for rotation around said beam and for endwise withdrawal therefrom; means including a conduction box with said beam and in substantial contact with the inside of said separation drum and defining passages on and in said beam leading from the perforate beam wall to the interior of said beam; and means defining a discharge opening at said one end of said beam communicating with said passages.

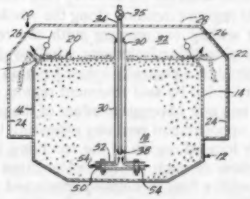


4,255,262

HYDRAULIC POWERED MIXING APPARATUS

Theodore H. O'Cheskey, Whittier, and Carroll C. Bunker, Covina, both of Calif., assignors to U.S. Filter Corporation, Whittier, Calif.

Continuation of Ser. No. 852,621, Nov. 18, 1977, abandoned.
This application Mar. 26, 1979, Ser. No. 23,848
Int. Cl.³ B03D *1/02, 1/24*
U.S. Cl. 210—221.2 **13 Claims**



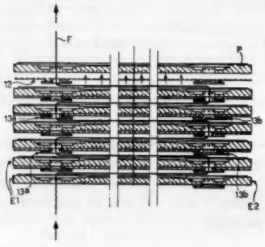
1. Mixing apparatus comprising:
a tank for holding a volume of liquid;
means for establishing an operating level for the liquid in the tank and a gas space above the liquid;
an upright draft tube disposed within the tank extending from above the operating level of the liquid to below the operating level of the liquid, the draft tube being in fluid communication with the tank at a level below the operating level of the liquid;
an impingement surface transverse to the draft tube below the level of fluid communication,
the upper portion of the draft tube being in communication with gas above the liquid for admitting gas into the draft tube to be mixed with the liquid in the tank;
a nozzle disposed within the draft tube at a substantial distance below the operating level for the liquid in the tank for directing a stream of liquid downwardly against the impingement surface;
a flange on the draft tube and spaced between about 0.1" and about 1" above the impingement surface; and
means for forcing the stream of liquid through the nozzle against the impingement surface to entrain bubbles of gas in the stream of liquid, the impingement surface and flange being disposed to deflect the stream of liquid and entrained bubbles radially outwardly from the draft tube into the volume of liquid in the tank.

4,255,263

STACKED ASSEMBLY FOR REVERSE OSMOSIS

Giuseppe Galimi, Turin; Mario Montalto, Grugliasco, and Luciano Pluchino, Turin, all of Italy, assignors to Costruzioni e Impianti S.p.A. Fiat Engineering, Turin, Italy

Filed Jul. 18, 1979, Ser. No. 58,596
Claims priority, application Italy, Aug. 10, 1978, 68888 A/78
Int. Cl.³ B01D *31/00*
U.S. Cl. 210—321.1 5 Claims



1. A stacked assembly for reverse osmosis comprising a plurality of semipermeable membranes superposed on rigid support plates, wherein:

(a) the support plates are of a flat generally rectangular shape and are identical with each other, while only a single semipermeable membrane is interposed between each pair of consecutive plates in the assembly;

(b) each plate comprises a receiving face and a delivery face, the receiving face being planar and formed in a centrally located region thereof with an array of intercommunicating grooves, whereas the delivery face comprises: a planar abutment region extending along the whole contour of the face for sealing engagement with the respective membrane, a plurality of elongate, shallow flow-conveying beds formed in a centrally located region of the delivery face surrounded by said abutment region, said beds being parallel to a pair of opposite edges of the plate and having each its opposite end portions extending beyond the said centrally located region of the receiving face;

(c) the bottom of each of the end portions of each bed is formed with a first through-aperture and with a flat bossage which surrounds the mouth of the aperture and is formed by a plurality of sectors defining radial passages therebetween, the height of said bossage being less than the depth of the respective end portion of the bed;

(d) at least one second through-aperture is formed in each plate within the area of said planar abutment region, this aperture being in communication with the said array of grooves in the receiving face of the plate;

(e) each of the membranes is formed with apertures matching the said first and second through-apertures in the plates; and

(f) each of the membranes is sealingly clamped to the receiving face of a respective plate both by the abutment region of the delivery face of the adjacent plate and by means of a plurality of mutually interchangeable plug members having each a shank portion which is forcibly engaged in the corresponding first through-apertures through the matching apertures in the membrane and protrudes axially from a disk portion integral with the shank, said disk portion being backed-up by the bossage sectors of the said adjacent plate thereby to clamp the membrane, the shanks of some of said plug members being axially open to allow passage of liquid therethrough while the shanks of the remaining plug members being blind to prevent passage of liquid through-apertures in which they are engaged to define first flow path means for a fluid between each membrane and the delivery face of the adjacent plate, said second through-apertures being in communication with each other and the grooves of each receiving face to define second flow path means for receiving only that portion of said fluid which passes through said membranes.

4,255,264

ROTARY DRUM OR DISC FILTER

Rud F. Madsen, Nakskov, Denmark, assignor to Aktieselskabet de Danske Sukkerfabrikker, Copenhagen, Denmark

Filed Jun. 13, 1979, Ser. No. 48,005
Claims priority, application Denmark, Jun. 23, 1979, 2839/79
Int. Cl.³ B01D *33/08*
U.S. Cl. 210—404 9 Claims

1. A rotary drum or disc filter comprising a rotary structure including a plurality of circumferentially distributed filter cells arranged in drum or disc formation and including walls defining a vacuum chamber, each of said filter cells being in permanent flow connection with a free outlet also forming part of the rotary structure and opening into said vacuum chamber in an angular position corresponding to that of the filter cell, so that filtrate extracted through all of said outlets under the influence of a vacuum in said vacuum chamber collects at the bottom thereof, a stationary filtrate extractor tube, which is permanently connected to a vacuum source, being provided within said vacuum chamber in a position to extract filtrate collected at the bottom of said chamber and to maintain a permanent state of vacuum in said chamber, each of said outlets being constructed to be capable of forming the jet receiving part of a jet propulsion pump, at least one steam or compressed air nozzle constructed to be capable of forming a matching jet delivering part of a jet propulsion pump being provided in said chamber and being connectable to a source of steam or compressed air and so arranged and controlled as to blow a jet of steam or compressed air into each outlet in a predetermined blow-off position of the respective filter cell, the outlet and the nozzle thereby combining to form a jet propulsion pump which sicks from the vacuum chamber and blows into the filter cell.

4,255,265

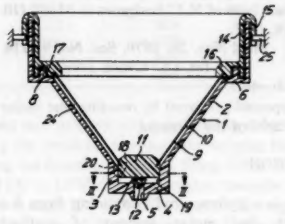
REUSABLE COFFEE FILTER

Albert Greutert, Sachseln, Switzerland, assignor to Maxs AG, Sachseln, Switzerland

Filed Apr. 21, 1980, Ser. No. 142,092
Claims priority, application Fed. Rep. of Germany, Apr. 23, 1979, 2916362
Int. Cl.³ B01D *25/04*
U.S. Cl. 210—474 14 Claims

1. A permanently useable coffee filter comprising a funnel-shaped container, of which the base is provided with at least one outlet opening, and a funnel-shaped filter insert comprising filter surfaces of perforated metal foil which is inserted into the container and of which the said surfaces are situated at a distance from the wall of the container thereby establishing an intermediate space (24), characterised in that the filter insert (9) carries at its end adjacent the outlet opening (5) an end piece (11) comprising a retaining pin (12) on its side facing towards the outlet opening (5), said pin being fitted with a conical seal (13), that the filter insert (9) can be moved into several different

positions relative to the container (1) and in that the end piece (11) and an adjacent region (3) of the container (1) are shaped



in such a way that at least one flow passage is present between them, its flow resistance being dependent upon the position of the filter insert relative to the container.

4,255,266

WATER PURIFICATION PROCESS

Henri Moreaud, Le Chesnay; Pierre Gilles, Sevran, and Jean-Paul Leglise, Montesson, all of France, assignors to O T V (Omnium de Traitements et de Valorisation), Courbevoie, France

Filed May 30, 1979, Ser. No. 43,709
Int. Cl.³ C02F 3/04
U.S. Cl. 210—614 **14 Claims**

1. In the process of purification of polluted water comprising percolating the water to be treated downward through a submerged fixed bed of granular material with insufflation, at an intermediate level of the bed, of a rising oxygenated gas current, the improvement wherein the linear velocity of the water through the bed exceeds 2 m/hr and the delivery of water to be treated and the delivery of oxygenated gas are otherwise regulated such that the following relations are satisfied:

$$\frac{Q_1}{S} \leqq (\alpha\,\epsilon - K_1)\,v \tag{1}$$

$$\frac{Q_2}{S} \leqq \frac{K_2 \cdot R}{OD}\,v\,(\alpha\,\epsilon - K_1) \tag{3}$$

and simultaneously:

$$\frac{Q_2 \cdot OD}{S \cdot h} \leqq K_3 \quad \text{or} \quad \frac{Q_2}{S} \leqq \frac{K_3 \cdot h}{OD}\,, \tag{4}$$

wherein

Q_1 is the delivery of oxygenated gas in m^3/hr,

Q_2 is the delivery of water to be treated in m^3/hr,

ϵ is the porosity of the granular material bed, ϵ being 0.45 and 0.55,

α is the maximum fraction of the volume that can be occupied by the gas without affecting the effectiveness of the treatment, α being 0.2 to 0.6,

S is the bed section in m^2,

h is the height of the bed in meters,

v is the vertical component of the average speed of the ascending gas bubbles in m/hr, v being 200 to 400 m/hr,

K_1 is a constant corresponding to the fraction of volume of bed occupied by immobilized gas pockets in m^3, K_1 being 0.02 to 0.08 m^3,

K_2 is the concentration of gas in oxygen in kg/m^3, K_2 being 0.2 to 1.40 kg/m^3,

K_3 is the value of the demand for oxygen that 1 m^3 of granular material can satisfy in 1 hour under operating conditions of the process in kg O_2/m^3 of granular material/hr, K_3 being less than 0.8 kg/m^3/hr,

R is the total transfer yield (or the fraction: weight of oxygen effectively dissolved/weight of oxygen injected in the bed), R being a function of the saturation solution (C_S) and real concentration (C) of oxygen in the bed according to the relation

$$R = K(C_S - C)$$

wherein K is between 2.7×10^{-3} and 25×10^{-3} $(mg/l)^{-1}m^{-1}$, and

OD is the demand for oxygen to be met, in kg per unit of volume of water to be treated, OD being between 0.7 and 1.2 times BOD_5 or total OD is 0.7 to 1.2 times BOD_5 plus 4 to 5 times N (of NH_4); and

wherein said granular material includes a material exhibiting a sufficient mechanical resistance so as not to sustain abrasion during bed washing, a granulometry between about 1 and about 8 mm, and an aptitude for fixing at least one of the elements necessary for biochemical reactions.

4,255,267

SEPARATION AND RECOVERY OF GRANULOCYTES FROM BLOOD USING ADHERENCE ON AN EXPANDABLE BED OF A POLYMERIC MATERIAL

Harvey H. Hoehn, Hockessin, Del., and John R. Wells, Culver City, Calif., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Nov. 2, 1979, Ser. No. 90,678
Int. Cl.³ B01D 15/00
U.S. Cl. 210—678 **11 Claims**

1. A process comprising passing blood through an expandable bed packed with synthetic normally solid polymer having a smooth surface and an average diameter of from about 90 μm to about 2000 μm whereby granulocytes become adhered to the packing, expanding the bed from 25% to 600%, and washing the granulocytes off the packing with a physiologically acceptable solution.

4,255,268

DRILLING MUD VISCOSIFIER

Jacob Block, Rockville, Md., assignor to W. R. Grace & Co., New York, N.Y.

Filed Jul. 14, 1978, Ser. No. 924,658
Int. Cl.³ C09K 7/04
U.S. Cl. 252—8.5 B **14 Claims**

1. In a water-based, clay-free drilling fluid for use in drilling bore holes into subterranean formations wherein the fluid includes water, a water-loss inhibitor, a weighting agent and a viscosifying agent, the improvement which comprises that said viscosifying agent is a ferric hydroxide reaction product formed in an aqueous media by contacting under a high degree of agitation a water soluble ferric salt with a water soluble base which contains or produces hydroxide groups in water in amounts to cause the hydroxy to ferric ratio to be at least about 3:1, and to cause the resultant fluid to have a pH of at least about 8; said viscosifying agent being present in an amount of from about 0.5 to 10 weight percent based on the weight of the water present to impart pseudoplasticity to the resultant drilling fluid.

4,255,269

METHOD AND APPARATUS FOR ADAPTING THE COMPOSITION OF A DRILLING FLUID FOR USE IN MAKING A HOLE IN THE EARTH BY ROTARY DRILLING

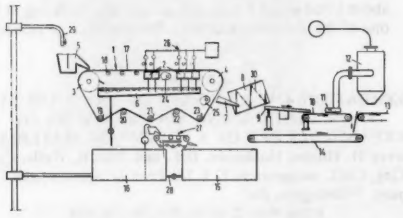
Bernardus Timmer, Borgercompagnie 181, Netherlands

Filed May 29, 1979, Ser. No. 43,229
Int. Cl.³ E21B 21/06
U.S. Cl. 252—8.5 R **6 Claims**

1. The method of adapting the composition of a drilling fluid, which includes additive solids, in a supply container for use in forming a hole in the earth by rotary drilling comprising the steps of subjecting a drilling fluid of deviant composition which includes drill cuttings and additive solids to a separating process which includes filtering said deviant fluid to remove

solids therefrom and then subjecting the solid residue to a vacuum to remove fluid clinging to the solid residue, feeding fluid obtained by the separating process including the fluid removed by said vacuum to the drilling fluid in said supply container to adjust the specific gravity thereof, drying the solid residue containing said drill cuttings and additive solids and reclaiming said additive solids therefrom.

4. Apparatus for adapting the composition of a drilling fluid in a supply container for use in forming a hole in the earth comprising an endless sieve conveyor belt carried by at least two rollers, means for feeding a deviant drilling fluid containing solid drill cuttings and at least one additive solid onto said



conveyor belt, means beneath said belt for receiving fluid filtered by said belt, vacuum means disposed beneath a portion of said belt for removing fluid clinging to the solids filtered from said fluid, a conduit connecting said fluid receiving means to said supply container for feeding said filtered fluid to said container, a drying furnace, means for feeding said filtered solids to said furnace, a solids separating zone, means for feeding the solids dried by said furnace to said separating zone, said separating zone including vibrating means for stratifying solids with the upper stratified layer containing said drill cuttings and another lower layer containing said additive solid, vacuum means for removing said upper stratified layer and means for receiving said separated chemical solid.

4,255,270

CHARACTERIZING PETROLEUM SULFONATES BY PHASE BEHAVIOR

Donald M. Sitton, and Homer J. Sarrett, Jr., both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Sep. 29, 1978, Ser. No. 947,232
Int. Cl.[3] C09K *3/00*
U.S. Cl. 252—8.55 D **34 Claims**

1. A method of characterizing a petroleum sulfonate of unknown average equivalent weight, comprising:

(a) identifying at least one substantially pure hydrocarbon which forms three phases, comprising; a predominantly water phase, a microemulsion phase and a predominantly oil phase, by equilibrating a mixture of said petroleum sulfonate of unknown average equivalent weight, water, an electrolyte and at least one substantially pure hydrocarbon; and

(b) assigning an effective average equivalent weight to said petroleum sulfonate of unknown average equivalent weight which is substantially equal to the average equivalent weight of a similarly prepared petroleum sulfonate of known average equivalent weight which when equilibrated with water, said electrolyte of step (a) and at least one substantially pure hydrocarbon, having an equivalent alkane carbon number substantially equal to the equivalent alkane carbon number of the pure hydrocarbon thus identified in step (a), in substantially the same proportions and under substantially the same conditions as said equilibration of step (a), forms three phases, comprising; a predominantly water phase, a microemulsion phase and a predominantly oil phase.

4,255,271

PHOSPHORUS-CONTAINING COMPOUNDS AND LUBRICANTS CONTAINING SAME

Andrew G. Horodysky, Cherry Hill, and Robert M. Gemmill, Jr., Pitman, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Nov. 20, 1979, Ser. No. 96,114
Int. Cl.[3] C10M *1/48*
U.S. Cl. 252—46.7 **20 Claims**

1. A compound prepared by reacting one molar amount of a carboxylic acid of the formula

R—COOH

wherein R is a hydrocarbyl containing from 9 to 49 carbon atoms with one molar amount of tris(hydroxymethyl-)aminomethane, reacting the resulting product with a phosphorus polysulfide, and reacting the product thus obtained with a member of the group consisting of a nitrogen-containing compound selected from the group consisting of (1) primary, secondary and tertiary amines containing 10 or more carbon atoms and (2) a polyalkyleneamine, an epoxide and an activated olefin selected from the group consisting of dienes, unsaturated aldehydes, vinylic esters, vinylic ethers, vinylic ketones, acrylonitrile and sulfurized olefins.

6. The compound of claim 1 wherein the activated olefin is a sulfurized olefin.

17. A method of reducing the fuel comsumption of an internal combustion engine by lubricating said engine with a lubricating oil composition comprising a major proportion of a lubricating oil and a friction reducing amount of a compound prepared by reacting one molar amount of a carboxylic acid of the formula

R—COOH

wherein R is a hydrocarbyl containing from 9 to 49 carbon atoms with one molar amount of tris(hydroxymethyl-)aminomethane, reacting the resulting product with a phosphorus polysulfide, and reacting the product thus obtained with a member of the group consisting of a nitrogen-containing compound selected from the group consisting of (1) primary, secondary and tertiary amines containing 10 or more carbon atoms and (2) a polyalkyleneamine, an epoxide and an activated olefin selected from the group consisting of dienes, unsaturated aldehydes, vinylic esters, vinylic ethers, vinylic ketones, acrylonitrile and sulfurized olefins.

4,255,272

METHOD FOR PRODUCING PIEZOELECTRIC CERAMICS

Toshio Ogawa, Nagaokakyo, Japan, assignor to Murata Manufacturing Co., Ltd., Kyoto, Japan

Filed Aug. 17, 1979, Ser. No. 67,420
Claims priority, application Japan, Aug. 17, 1978, 53-101212
Int. Cl.[3] C04B *35/46, 35/48, 35/64*
U.S. Cl. 252—62.9 **13 Claims**

1. A method for producing a piezoelectric ceramic of a system $Pb(Sn_\alpha Sb_{1-\alpha})O_3$-$PbTiO_3$-$PbZrO_3$, which comprises

(a) preparing a mixture of raw materials selected from the group consisting of oxides and materials which produce oxides by calcination, to provide a piezoelectric ceramic composition expressed by the general formula $xPb(Sn_\alpha Sb_{1-\alpha})O_3$-$yPbTiO_3$-$zPbZrO_3$ wherein subscrips α, x, y and z are mole fractions of the respective components and wherein $x+y+z=1.00$, $\frac{1}{4} \leqq \alpha \leqq \frac{3}{4}$, said composition falling within a polygonal area defined by the points A, B, C, D and E in FIG. 3 (except the compositions defined by a line connecting the points A and E), the sets of mole fractions of the three components at said points being as follows:

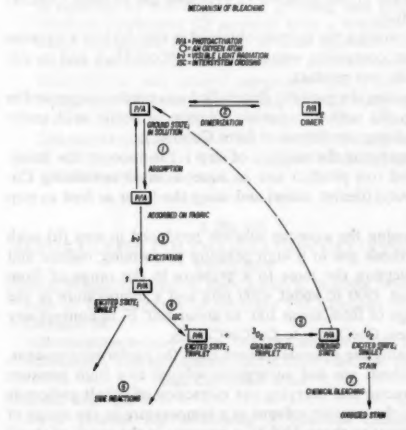
	x	y	z
A	0.01	0.99	0.00
B	0.01	0.04	0.95
C	0.04	0.01	0.95
D	0.40	0.01	0.59
E	0.40	0.60	0.00

(b) calcining said mixture and grinding the calcined body,
(c) forming the resultant powder into forming bodies, and
(d) sintering the forming bodies by firing them at a temperature of 1100°to 1350° C. in an oxygen atmosphere containing not less than 80 vol% of oxygen so as to produce an intermediate pyrochlore phase of $Pb_2Sn_{2\alpha}Sb_{2-2\alpha}O_{7-\alpha}$with oxygen defects at the grain boundaries of the forming bodies during the sintering process which promotes transfer of oxygen ions at said boundaries and effects the production of a fine, dense ceramic; said pyrochlore phase being converted into a perovskite phase $Pb(Sn_\alpha\ Sb_{1-\alpha})O_3$ at the end of the firing.

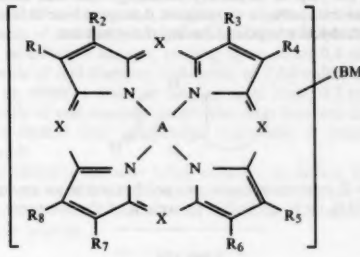
4,255,273
FABRIC BLEACHING AND STAIN REMOVAL COMPOSITIONS

Nabil Y. Sakkab, Maineville, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Filed Jan. 10, 1979, Ser. No. 2,415
Claims priority, application Philippines, Jan. 11, 1978, 20642
Int. Cl.³ C11D 7/54
U.S. Cl. 252—102 **45 Claims**



1. A bleach composition consisting essentially of:
(a) from about 0.5% to about 50% by weight of the composition of a cationic substance;
(b) from 0.001% to 0.5% by weight of the composition of a water soluble photoactivator having the formula



wherein each X is (=N—) or (=CY—), and the total number of (=N—) groups is 0, 1, 2, 3 or 4; wherein each Y, independently, is hydrogen or meso substituted alkyl, cycloalkyl, aralkyl, aryl, alkaryl or heteroaryl; wherein each R, independently, is hydrogen or pyrrole substituted alkyl, cycloalkyl, aralkyl, aryl, alkaryl or heteroraryl, or wherein adjacent pairs of R's are joined together with ortho-arylene groups to form pyrrole substituted alicyclic or heterocyclic rings; wherein A is 2(H) atoms bonded to diagonally opposite nitrogen atoms, or Zn(II), Cd(II), Mg(II), Sc(III), or Sn(IV); wherein B is an anionic, nonionic or cationic solubilizing group substituted into Y or R; wherein M is a counterion to the solubilizing groups; and wherein s is the number of solubilizing groups; and
(c) balance selected from the group consisting of water, alcohols, glycols and glycol ethers, hydrotropes, clay, substrate, nonionic surfactants used in ratio to cationic substance between about 5:3 and about 200:1, insoluble aluminosilicate builder, and alkanolamine.

4,255,274
PREPARATION OF GRANULAR SODIUM TRIPOLYPHOSPHATE PRODUCTS

Paul L. Hensler; Delmar F. Church, both of Lawrence, Kans., and Robert W. Beger, Mount Zion, Ill., assignors to FMC Corporation, Philadelphia, Pa.

Filed Jan. 2, 1979, Ser. No. 619
Int. Cl.³ C01B 15/16; C11D 7/16
U.S. Cl. 252—135 **16 Claims**

1. A process for producing a granular sodium tripolyphosphate product having low friability, high absorptivity, and a bulk density within the range of from about 0.65 g/cc to about 0.87 g/cc, which comprises moisturising an agitated feed material consisting essentially of dense rotary dried sodium tripolyphosphate (in essentially non-hydrated form) having a bulk density of at least 0.9 g/cc and a particle size distribution of 0 to 85% by weight +20 mesh, 15 to 100% by weight −20 +100 mesh and 0 to 20% by weight −100 mesh, by adding a sufficient amount of water thereon to produce a moisturized material containing on the average between 10 and 30% by weight moisture, calcining the moisturized material to a temperature within the range of from about 300° to about 600° C. and recovering said granular sodium tripolyphosphate product.

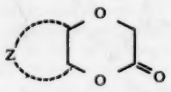
4,255,275
BENZODIOXANONES AND ORGANOLEPTIC USES THEREOF

Mark A. Sprecker, Sea Bright; John B. Hall, Rumson, and Frederick L. Schmitt, Holmdel, all of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Division of Ser. No. 75,071, Sep. 13, 1979, Pat. No. 4,241,097.
This application May 2, 1980, Ser. No. 146,321
Int. Cl.³ C11D 3/50, 9/44
U.S. Cl. 252—174.11 **1 Claim**

1. A process for augmenting or enhancing the the aroma of

a solid or liquid anionic, cationic or nonionic detergent comprising the step of intimately admixing with said solid and liquid anionic, cationic or nonionic detergent base at least one cyclic chemical compound having the structure:



wherein Z represents benzo or cyclohexano in an amount of from 0.01% up to about 3% by weight of the detergent.

4,255,276

SILICATIC COMPLEXING AGENT FOR ALKALINE EARTH IONS AND METHOD OF PREPARING SAME

Rudolf Fahn, Gammelsdorf, and Nikolaus Fenderl, Moosburg, both of Fed. Rep. of Germany, assignors to Süd-Chemie Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Jun. 14, 1978, Ser. No. 915,626

Claims priority, application Fed. Rep. of Germany, Jun. 15, 1977, 2727053

Int. Cl.[3] **C02B** *1/16;* **C01B** *31/16;* **C02B** *1/40;* **C09K** *3/32*

U.S. Cl. 252—184 **16 Claims**

2. A silicatic complexing agent for alkaline earth metal ions consisting essentially of an acid activated mineral of the montmorillonite-beidellite series, which mineral is charged with an alkali metal, said mineral having the formula

$$(Me_2^{I}O)_x(Me^{II}O)_yMe_2^{III}O_3(SiO_2)_z$$

wherein the symbols have the following meaning:

Me^{I} is sodium and/or potassium

Me^{II} is magnesium and calcium

Me^{III} is aluminum and iron

$x=1.5$ to 6

$y=0.2$ to 1

$z=6.2$ to 8.

4,255,277

STORAGE STABLE PEROXIDE PASTE COMPOSITION

Robert W. Smearing, Scotia, N.Y., assignor to General Electric Company, Waterford, N.Y.

Filed Jan. 29, 1979, Ser. No. 7,581

Int. Cl.[3] **C07C** *179/10;* **C11D** *3/395, 7/54*

U.S. Cl. 252—186 **9 Claims**

1. A storage stable peroxide paste composition comprising:

(a) benzoyl peroxide or benzoyl peroxide having one or more substituents selected from halogen, lower alkyl or lower alkoxy;

(b) a minor proportion of water; and

(c) finely divided particulate calcium carbonate in an amount sufficient to prevent the composition from physically separating into its components.

4,255,278

PARTIAL OXIDATION PROCESS WITH RECOVERY OF UNCONVERTED SOLID FUEL FROM SUSPENSION IN WATER

Roy D. Roberts, Lakewood, and George N. Richter, San Marino, both of Calif., assignors to Texaco Inc., White Plains, N.Y.

Continuation of Ser. No. 921,416, Jul. 3, 1978, abandoned. This application Jun. 28, 1979, Ser. No. 52,715

Int. Cl.[3] **C10J** *3/46;* **C10K** *1/02, 1/10*

U.S. Cl. 252—373 **4 Claims**

1. A partial oxidation process with the separation of particles having a high carbon content from particles having a low carbon content, said particles being suspended in water, said suspension being produced by passing downwardly through the bottom outlet of a partial oxidation zone into a quench chamber containing water, gas containing entrained particles of ash and unconverted solid fuel, producing said gas by the partial oxidation in the fly ash mode of a fresh feed of solid ash-containing carbonaceous fuel in said partial oxidation zone, screening said suspension to remove large particles of materials, separating said screened suspension by subjecting same in a continuous centrifuge to a gravitational force between 10 and 1000 G's into a cake portion containing particles high in carbon content and a dilute water suspension of particles low in carbon content and recycling the centrifuge cake and introducing it with said fresh feed into the partial oxidation zone to provide for increased carbon conversion.

4,255,279

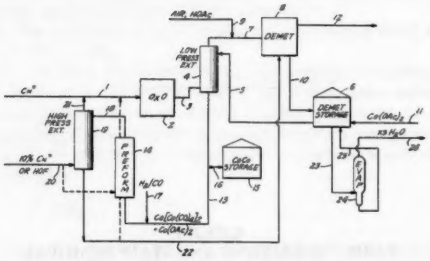
DUAL DEMETALLING OF OXO PRODUCTS WITH CATALYST RECYCLE

Ralph J. Spohn, Baton Rouge, La.; Paul A. Ellsworth, Sandwich, Mass., and John Lyford, IV, Baton Rouge, La., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Jul. 20, 1979, Ser. No. 59,474

Int. Cl.[3] **B01J** *31/40;* **C07C** *27/22, 29/16, 45/50*

U.S. Cl. 252—413 **12 Claims**



11. A process for demetalling an oxo product contaminated with cobalt-containing catalyst residues and recovering cobalt carbonyls therefrom which comprises in combination the following steps:

(a) extracting a portion of the $HCo(CO)_4$ dissolved in the crude oxo product with an aqueous solution of cobalt acetate in the presence of synthesis gas to form $Co[Co(CO)_4]_2$;

(b) separating the mixture obtained in step (a) into a aqueous layer containing water-soluble $Co[Co(CO)_4]_2$ and an oil-phase oxo product;

(c) treating the partially demetalled oxo product separated in step (b) with an aqueous solution of acetic acid under oxidizing conditions to form $Co(OAc)_2$;

(d) separating the mixture of step (c) to recover the demetalled oxo product and an aqueous layer containing $Co(OAc)_2$ (demet water) and using the latter as feed to step (a);

(e) passing the aqueous solution produced in step (b) with synthesis gas to a high pressure preforming reactor and subjecting the same to a pressure in the range of from about 1500 to about 4500 psig and a temperature in the range of from about 100° to about 400° F. to convert any excess $Co(OAc)_2$ to $Co[Co(CO)_4]_2$;

(f) passing the aqueous effluent from the preforming reactor, synthesis gas and an organic solvent to a high pressure extractor and carrying out extraction of cobalt carbonyls into the organic solvent at a temperature in the range of ambient to about 350° F., a pressure in the range of about 1500 to about 4500 psig and a ratio by volume of organic solvent/aqueous effluent of about 1:10 to 10:1; and

(g) passing the organic solvent extract into the oxo reactors as catalyst.

12. A process according to claim 11 in which the organic

solvent consists of about 10% of the total olefin feed used for the oxo reaction.

4,255,280

CATALYST FOR POLYMERIZATION OF OLEFINS

Hisaya Sakurai; Hideo Morita; Masayoshi Miya; Katsuhiko Takaya, and Haruyuki Yoneda, all of Kurashiki, Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Mar. 12, 1979, Ser. No. 19,674

Claims priority, application Japan, Mar. 15, 1978, 53-28574; Mar. 15, 1978, 53-28575; Mar. 22, 1978, 53-31672; Mar. 24, 1978, 53-32899; Mar. 28, 1978, 53-34987; Mar. 28, 1978, 53-34988; Apr. 14, 1978, 53-43262; Apr. 14, 1978, 53-43263

Int. Cl.³ C08F *4/64*

U.S. Cl. 252—429 B **12 Claims**

1. In a catalyst useful for polymerizing olefins comprising a magnesium compound, a titanium compound, an electron donor, and an organometallic compound, wherein a solid (1) obtained by reacting one mole of (i) an organomagnesium component of the formula

$$M_\alpha Mg_\beta R_p^1 R_q^2 X_r$$

wherein

α, p, q and r each independently $\geqq 0$,

$\beta > 0$, $^{\tau}$

$p+q+r=m\alpha+2\beta$

M is Al, Zn, B or Be,

m is the valence of M,

R^1 and R^2 are the same or different hydrocarbon groups having 1–20 carbon atoms, and

X is a halogen atom,

or of the reaction product of $M_\alpha Mg_\beta R_p^1 R_q^2 X_r$ with an electron donor, with 0.01 to 100 moles of (ii) a chlorosilane compound containing Si—H bonds and of the formula

$$H_a SiClR^3_{4-(a+b)}$$

wherein

$0 < a \leqq 2$,

$b > 0$,

$a+b \leqq 4$, and

R^3 is a hydrocarbon group having 1–20 carbon atoms, is used as a catalyst raw material, a solid catalyst component (A) is obtained by reacting and/or grinding said solid (1), a titanium compound (2) selected from a tetravalent titanium compound containing at least one halogen atom and/or a halide of trivalent titanium, and a carboxylic acid ester (3) and said catalyst component (A) is used with a component (B) which is an organometallic compound and a carboxylic acid ester (3), the improvement wherein said last-mentioned carboxylic acid ester (3) of component (B) is a nitrogen-, sulfur- and/or oxygen-containing heterocyclic carboxylic acid ester.

4,255,281

ALPHA-OLEFIN POLYMERIZATION CATALYST AND PROCESS

John B. Rogan, Glen Ellyn, and Charles K. Buehler, Woodridge, both of Ill., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Continuation-in-part of Ser. No. 892,388, Mar. 31, 1978, abandoned. This application Jul. 3, 1979, Ser. No. 54,460

Int. Cl.³ C08F *4/64*

U.S. Cl. 252—429 B **8 Claims**

1. A process for modifying a titanium trichlorideorganoaluminum compound alpha-olefin polymerization catalyst to reduce production of alkane soluble products during polymerization of alpha-olefins in the presence of said catalyst without substantial decreases in catalyst activity, said process comprising combining, in an inert diluent in the substantial absence of catalyst poisons, components comprising:

(a) at least one lower alkyl dialkylaluminum chloride;

(b) an activated titanium trichloride;

(c) an effective amount, ranging up to about 0.2 mole per mole of said titanium trichloride, of bis-(tributyltin)sulfide;

(d) an effective amount, ranging up to about 0.4 mole per mole of said titanium trichloride, of 2,4,6-collidine; and

(e) an effective amount, ranging up to about 0.3 mole per mole of said titanium trichloride, of at least one dimethyl or diethyl ester of phthalic, isophthalic or terephthalic acid;

said effective amounts being effective to reduce levels of alkane soluble components produced during polymerization of alpha-olefins without substantial decreases in catalyst activity.

4,255,282

HYDROTREATING CATALYST AND PROCESS FOR ITS PREPARATION

Howard D. Simpson, Irvine, Calif., assignor to Union Oil Company of California, Los Angeles, Calif.

Filed May 11, 1979, Ser. No. 38,334

Int. Cl.³ B01J *27/14*; C10G *45/04, 17/00*

U.S. Cl. 252—435 **17 Claims**

1. A hydrotreating catalyst comprising molybdenum, nickel, and phosphorus components supported on gamma alumina, said catalyst having been prepared by the method comprising the steps of compositing a support comprising gamma alumina precalcined at a temperature of at least 1375° F. with components of molybdenum, nickel, and phosphorus, and calcining the resulting composite at an elevated temperature.

4,255,283

OXYDEHYDROGENATION PROCESS FOR ALKYLAROMATICS AND CATALYST THEREFOR

Joseph P. Bartek, University Heights, and Robert K. Grasselli, Chagrin Falls, both of Ohio, assignors to The Standard Oil Company, Cleveland, Ohio

Division of Ser. No. 792,637, May 2, 1977, abandoned. This application Mar. 23, 1978, Ser. No. 889,177

Int. Cl.³ B01J *21/02, 27/14*

U.S. Cl. 252—437 **14 Claims**

1. The catalyst composition represented by the empirical formula:

$$A_a M_b M^1_c M^{11}_d B_e P_y O_x$$

wherein

A is an alkali metal and or thallium;

M is one or more elements of nickel, cobalt, copper, manganese, magnesium, zinc, calcium, niobium, tantalum, strontium or barium;

M^1 is one or more of the elements of iron, chromium, uranium, thorium, vanadium, titanium, lanthanum or the other rare earths;

M^{11} is one or more of the elements of tin, boron, lead, germanium, aluminum or tungsten,

B is one or more of the elements of bismuth, antimony, and arsenic;

P is phosphorus; and

wherein

a through y have the following values:

$a=0$ to 5;

$b=4$ to 20;

$c=0.1$ to 10;

$d=0$ to 4;

$e=0.1$ to 12;

$y=8$ to 16;

x=the number of oxygens required to satisfy the valence requirements of the other elements present; and

wherein the sum of $2b+3(c+e)$ is greater than 9 and less than 3y.

4,255,284

DEHYDROGENATION CATALYST

Harley F. Hardman, Lyndhurst, Ohio, assignor to Standard Oil Company (Ohio), Ohio

Division of Ser. No. 643,464, Dec. 22, 1975. This application Aug. 15, 1978, Ser. No. 934,103

Int. Cl.[3] B01J *27/14, 29/00, 23/10, 23/16*

U.S. Cl. 252—437 14 Claims

1. A catalyst having the composition:

$$A_aCo_bMo_cO_x$$

wherein

A consists of at least two of the elements selected from the group consisting of phosphorus, magnesium, iron and nickel,

and wherein

a is a number from 0.1 to 1

b is a number from 0.5 to 3

c is a number from 0.5 to 3, and

x is a number determined by the valence requirements of A, Co, and Mo;

with the proviso that A cannot consist of the combination of Ni and P alone.

4,255,285

COATED CATALYSTS AND THEIR PREPARATION

Heinz Engelbach, Limburgerhof; Harry Hoffmann, Ludwigshafen; Peter Palm, Gerolsheim; Karl Sommer, and Michael J. Sprague, both of Ludwigshafen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Mar. 23, 1979, Ser. No. 23,359

Claims priority, application Fed. Rep. of Germany, Apr. 3, 1978, 2814262

Int. Cl.[3] B01J *23/22*

U.S. Cl. 252—443 17 Claims

1. A coated catalyst, comprising a non-porous or slightly porous carrier and a layer of catalytic material, containing vanadium compounds, applied thereto, which is obtained by atomizing a mixture of water and a vanadium compound, with or without other metal compounds, and applying this mixture as a coating onto carrier particles which are themselves in constant motion, at from 20° to 90° C. and with a rate of application of from 0.001 to 0.02 part by weight of solids per part by volume of carrier beads per minute, then drying the coated catalysts thus obtained and, by flame heating or plasma heating of the coated catalyst particles which are themselves in constant motion, repeatedly heating all parts of the catalyst surface briefly to above 700° C. and cooling to below 650° C.

4,255,286

PROCESS OF PREPARING SPHERICAL MICROPARTICLES

Dusan Berek, and Ivan Novak, both of Bratislava, Czechoslovakia, assignors to Urad Predsednictva Slovenskej Akademie, Bratislava, Czechoslovakia

Filed Sep. 25, 1978, Ser. No. 945,339

Claims priority, application Czechoslovakia, Sep. 23, 1977, 6164/77

Int. Cl.[3] B01J *20/28, 20/10;* C01B *33/152, 33/16*

U.S. Cl. 252—448 2 Claims

1. A process for preparing spherical microparticles of silica gel having a size varying from 0.5 to 1000 μm in diameter, comprising dispersing a water glass solution into macromolecular polydimethylsiloxane, subjecting said water glass to controlled polymerization under static conditions to form said spherical microparticles and recovering said silica gel spherical microparticles.

2. The process according to claim 1 wherein said polydimethylsiloxane has an average molecular weight of 1000.

4,255,287

CRACKING CATALYST

Brent J. Bertus, and Dwight L. McKay, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Continuation-in-part of Ser. No. 845,184, Oct. 25, 1977, abandoned. This application Sep. 12, 1978, Ser. No. 941,896

Int. Cl.[3] B01J *29/06*

U.S. Cl. 252—455 Z 59 Claims

1. A modified cracking catalyst composition which comprises zeolite cracking catalyst having in combination therewith a containing silica-alumina amount of a treating agent which comprises (A) at least one of elemental antimony and compounds of antimony and (B) at least one of elemental tin and compounds of tin.

4,255,288

ZIRCONIA-CONTAINING CATALYSTS

Neville L. Cull, Baker, and Willard H. Sawyer, Baton Rouge, both of La., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Aug. 13, 1979, Ser. No. 65,768

Int. Cl.[3] B01J *29/10*

U.S. Cl. 252—455 Z 14 Claims

1. A catalyst prepared by the steps which comprise:

(a) mixing an ultrastable Y-type crystalline aluminosilicate zeolite and alumina;

(b) treating the product resulting from step (a) with a zirconium compound convertible to zirconium oxide by calcination;

(c) calcining the product resulting from step (b), thereby converting the zirconium compound to zirconium oxide;

(d) compositing the product resulting from step (c) with a hydrogenation component comprising at least one Group VIB metal component and at least one Group VIII metal component, and

(e) recovering a catalyst consisting essentially of said ultrastable Y-type zeolite, alumina, zirconium oxide and a hydrogenation component selected from the group consisting of an elemental metal, metal oxide and metal sulfide, of at least one Group VIB metal and an elemental metal, metal oxide and metal sulfide of at least one Group VIII metal and mixtures thereof.

2. The catalyst of claim 1 wherein said alumina additionally comprises from about 1 to about 6 weight percent silica, based on the alumina, and wherein the recovered catalyst also comprises said silica.

4,255,289

PROCESS FOR THE PREPARATION OF MAGNETIC CATALYSTS

George J. Balinsky; Lloyd A. Pine, and Joseph K. Mertzweiller, all of Baton Rouge, La., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Dec. 26, 1979, Ser. No. 106,494

Int. Cl.[3] B01J *21/04, 23/40, 23/42, 23/74*

U.S. Cl. 252—466 B 12 Claims

1. In a process for the preparation of a catalyst for use in reforming a hydrocarbon feed in a reforming zone at reforming conditions, wherein a bed of fluidizable, magnetizable catalytic particles is contacted and fluidized with a hydrocarbon feed and hydrogen while simultaneously subjected to an applied magnetic field, and a product of improved octane is withdrawn from said reforming zone, the improvement which comprises

incorporating a Group VIII noble metal within an inorganic oxide particulate mass,

admixing said metal-containing inorganic oxide particulate mass with magnetic alloy particles and an inorganic oxide precursor which serves as a binder,

forming a particulate composite mass comprising particles of magnetic alloy dispersed as inclusions within an inorganic oxide matrix, and then

drying and calcining said composite mass.

4,255,290

NONACIDIC MULTIMETALLIC CATALYTIC COMPOSITE

John F. Flagg, Rosemont, and George J. Antos, Bartlett, both of Ill., assignors to UOP Inc., Des Plaines, Ill.

Division of Ser. No. 932,576, Aug. 10, 1978, which is a continuation-in-part of Ser. No. 758,285, Jan. 10, 1977, Pat. No. 4,110,199. This application Aug. 10, 1979, Ser. No. 65,672

Int. Cl.³ B01J *23/58, 23/78, 23/89*

U.S. Cl. 252—466 B 14 Claims

1. A nonacidic catalytic composite consisting essentially of a porous carrier material and, on an elemental basis, about 0.01 to about 2 wt. % platinum group metal, about 0.05 to about 5 wt. % cobalt, about 0.1 to about 5 wt. % alkali metal or alkaline earth metal, and about 0.1 to about 10 wt. % uranium; wherein the platinum group, catalytically available cobalt, uranium and alkali or alkaline earth components are uniformly dispersed throughout the porous carrier material; wherein substantially all of the platinum group component is present in the elemental metallic state; wherein substantially all of the catalytically available cobalt component is present in the elemental metallic state or in a state which is reducible to the elemental state or in a mixture of these states; and wherein substantially all of the uranium and alkali or alkaline earth components are present in an oxidation state above that of the corresponding elemental metal.

4,255,291

AIR-FIREABLE CONDUCTOR COMPOSITION

Christopher R. S. Needes, and Joseph R. Rellick, both of Newark, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jun. 21, 1979, Ser. No. 50,611

Int. Cl.³ H01B *1/06*

U.S. Cl. 252—578 13 Claims

1. Conductor compositions consisting essentially of finely divided inorganic powders dispersed in an inert organic liquid, said inorganic powders being 54 to 91 weight percent of metal and 9 to 46 weight percent of a glass frit, said metal being a mixture of an intermetallic phase of copper-aluminum powder-/aluminum powder in a weight ratio of 1.4 to 1.8/1.

4,255,292

PERFUMING COMPOSITION CONTAINING 3-PHENYL-CYCLOHEX-2-EN-1-ONE

Wolfgang Giersch, and Günther Ohloff, both of Bernex, Switzerland, assignors to Firmenich SA, Geneva, Switzerland

Filed Sep. 14, 1979, Ser. No. 75,418

Claims priority, application Switzerland, Sep. 27, 1978, 10058/78

Int. Cl.³ C11C *9/00*

U.S. Cl. 252—522 R 1 Claim

1. A process for improving, enhancing, or modifying the odorous properties of a perfume, or a perfume base which comprises adding thereto a perfuming effective amount of 3-phenyl-cyclohex-2-en-1-one to impart a warm and spicy scent reminiscent of courmarin thereto.

4,255,293

2,6,6-TRIMETHYL-α-(ISO-PROPENYL-1-CYCLOHEX-ENE-1-METHANOL AND 1,3 CYCLOHEXADIENE-1-METHANOL

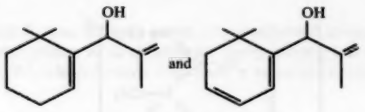
Richard A. Wilson, Westfield; William L. Schreiber, Jackson; Braja D. Mookherjee, Holmdel, all of N.J.; Jacob Kiwala, Brooklyn, N.Y.; Joaquin F. Vinals, Red Bank, N.J.; Manfred H. Vock, Locust, N.J.; Gilbert Stork, Englewood, N.J., and Frederick L. Schmitt, Holmdel, N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Division of Ser. No. 39,361, May 15, 1979, Pat. No. 4,243,823. This application Feb. 8, 1980, Ser. No. 119,859

Int. Cl.³ C11B *9/00*

U.S. Cl. 252—522 R 1 Claim

1. A process for agumenting or enhancing the aroma of perfume or cologne compositions comprising the step of adding to perfume or cologne have an aroma augmenting or enhancing quantity of a compound having a structure consisting of



4,255,294

FABRIC SOFTENING COMPOSITION

Jerome Rudy, Livingston; Frederick Lazzara, Teaneck, both of N.J.; Warren W. Cowles, Pittsford, and Arno Cahn, Pearl River, both of N.Y., assignors to Lever Brothers, New York, N.Y.

Continuation of Ser. No. 94,577, Jun. 14, 1971, abandoned, which is a continuation of Ser. No. 743,325, Jul. 9, 1968, abandoned, which is a continuation-in-part of Ser. No. 551,956, May 23, 1966, abandoned. This application Apr. 1, 1975, Ser. No. 563,963

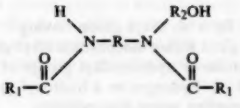
Int. Cl.³ C11D *1/86, 3/30, 3/28*

U.S. Cl. 252—524 4 Claims

1. A multi-functional detergent composition consisting essentially of

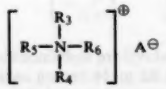
(1) a cationic nitrogenous compound having from 15 to 65 carbon atoms in its molecule and having at least one cationic nitrogen atom, said cationic nitrogenous compound being selected from the group consisting of:

(i) the reaction product of higher fatty acids with hydroxy alkyl alkylene diamines in a molecular raio of about 2:1, said reaction product containing a composition having a compound of the formula



wherein R is a C_1–C_3 alkylene radical, R_1 is a C_{15} to C_{19} acyclic aliphatic hydrocarbon radical and R_2 is a divalent C_1–C_3 alkylene radical;

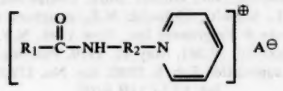
(ii) quaternary ammonium compounds having the formula



wherein R_3 is a C_{16}–C_{20} acyclic, aliphatic hydrocarbon group, R_4 and R_5 are selected from the group consisting

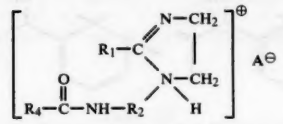
of R_3 and C_1–C_3 alkyl groups, R_6 is a C_1–C_3 alkyl group or a benzyl group and $A^{\ominus}$ is an anion imparting water dispersibility;

(iii) alkanamide alkylene pyridinium chloride having the formula



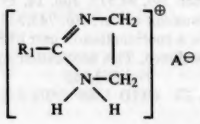
wherein R_1 is a C_{15}–C_{19} acyclic, aliphatic hydrocarbon radical and R_2 is a divalent C_1–C_3 alkylene radical, and A is a chlorine atom;

(iv) 1-(2-alkylamido ethyl)-2-alkyl imidazoline salts having the formula



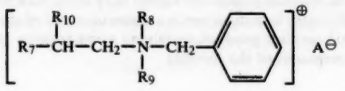
wherein R_1, R_2 and R_4 are as defined above and $A^{\ominus}$ is an anion imparting water dispersibility;

(v) the salts of heptadecyl imidazoline having the formula



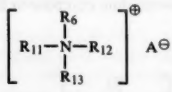
wherein R_1 is a heptadecyl radical and $A^{\ominus}$ is an anion which imparts water dispersibility;

(vi) quaternary benzyl amines of the formula



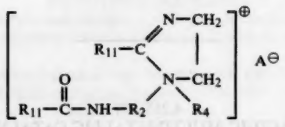
wherein R_7 is an alkyl group having 7 to 12 carbon atoms, R_8 and R_9 are independent alkyl groups of 1 to 3 carbon atoms or hydroxyalkyl groups of 2 to 3 carbon atoms, R_{10} is hydrogen or a hydroxyl group $A^{\ominus}$ is an anion imparting water dispersibility;

(vii) compounds of the formula



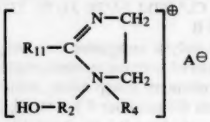
wherein R_8 and $A^{\ominus}$ are as defined above, R_{11} is an alkyl group having 12 to 14 carbon atoms, R_{12} is selected from the group consisting of R_8 and R_{11}, and R_{13} is selected from the group consisting of R_8 and benzyl;

(viii) compounds of the formula



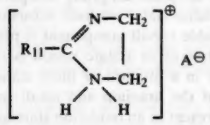
wherein R_2 is a divalent alkylene group having 1 to 3 carbon atoms, R_4 is an alkyl group having 1 to 3 carbon atoms, and R_{11} and A are defined above;

(ix) compounds of the formula



wherein R_2, R_4, R_{11} and A are as defined above; and

(x) compounds of the formula



(2) an anionic organic detergent compound selected from the group consisting of the water soluble organic sulfate and sulfonate salts having a hydrocarbon group of 8 to 22 carbon atoms, said cationic nitrogeneous compound and anionic detergent being so selected that when combined in a 1:1 mole ratio in a cationic-anionic complex the complex will have a total of 2 to 4 long-chain alkyl groups of 12 to 24 carbon atoms and a total of at least 29 carbon atoms, the molar ratio of said anionic detergent compound to said cationic nitrogenous compound being between $\frac{1}{2}$:1 and 12:1, and

(3) a nonionic dispersant which is an alkyl alcohol-ethylene oxide condensate having 12–22 carbon atoms in the alkyl group containing from 60% to 75% ethylene oxide, there being for each 100 parts of said cationic nitrogenous compound from 9 to 20 parts of said nonionic dispersant, said dispersant further being present in an amount less than 10% by weight of the cationic nitrogenous compound and the anionic organic detergent, wherein said multifunctional detergent composition further contains

(a) between 8% and 22% by weight of said anionic detergent compound (2);

(b) from 35% to 65% by weight of a builder effective to improve the detergent properties of said anionic organic detergent;

(c) from 1% to 7.5% sodium silicate; and

(d) from 0.5% to 7.5% of sodium xylene sulfonate or sodium toluene sulfonate.

4,255,295

PROCESS FOR THE REGENERATION OF POLYMER FROM WASTE

Bernard Regnault, Roussillon, and Pierre Revol, Villeurbanne, both of France, assignors to Rhone-Poulenc-Textile, Paris, France

Filed Oct. 1, 1979, Ser. No. 80,298
Claims priority, application France, Oct. 18, 1978, 78 30260
Int. Cl.³ B29C *29/00*
U.S. Cl. 260—2.3 **5 Claims**

1. A process for the production of a poly-(polymethylene

terephthalate) polymer of good spinnability from waste of low bulk density containing poly-(polymethylene) terephthalate, characterized in that the said waste is finely chopped, compressed by means of a screw until a bulk density of at least 500 kg/m^3 is reached, then introduced in this form into a double screw degassing extruder in which it is melted whilst the traces of water and of volatile impurities are removed, and the molten polymer then is subjected to a post-condensation operation under reduced pressure thereby raising its intrinsic viscosity to the desired value and decomposing the non-volatile impurities to give volatile products which are removed under the reduced pressure.

4,255,296

POLYBUTADIENE RUBBER COMPOSITION

Masaki Ogawa, Sayama, and Tamio Araki, Kodaira, both of Japan, assignors to Bridgestone Tire Company Limited, Tokyo, Japan

Filed Nov. 28, 1978, Ser. No. 964,310

Claims priority, application Japan, Dec. 2, 1977, 52-144021; Dec. 2, 1977, 52-144022; Aug. 9, 1978, 53-96198

Int. Cl.^{3} C08L *89/00*; C08F *136/06*

U.S. Cl. 260—5 **10 Claims**

1. A composition comprising a polybutadiene rubber containing a polymer obtained by block or graft polymerization of cis-1,4-polybutadiene with syndiotactic(syn)-1,2-polybutadiene in which a microstructure is of 78 to 93% by weight of cis-1,4-structure and 6 to 20% by weight of syn-1,2-structure, at least 40% by weight of said syn-1,2-polybutadiene being crystallized and in a short fiber-like shape having an average diameter of 0.05 to 1μ and an average length of 0.8 to 10μ.

4,255,297

ADHESIVE BINDING AGENTS AND ADHESIVES CONTAINING THEM

Gerhard Werner, Glashuütten; Heinz Schmelzer, Rümmelsheim, and Richard Sattelmeyer, Schlangenbad-Georgenborn, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

Filed Dec. 6, 1978, Ser. No. 967,016

Claims priority, application Fed. Rep. of Germany, Dec. 22, 1977, 2757177

Int. Cl.^{3} C08G *61/02*; C08L *65/00*

U.S. Cl. 260—5 **11 Claims**

1. An adhesive binding agent based on at least one alkylation reaction product polymer of dicyclopentadiene and at least one aromatic hydrocarbon wherein the reaction product polymer consists of from 40 to 80% by weight of cyclopentadiene units and from 20 to 60% by weight of at least one aromatic hydrocarbon having a boiling point in the range from 110° to 220° C., selected from the group consisting of methyl-substituted aromatic hydrocarbons and tetrahydronaphthalene, wherein in the reaction product polymer composed of the dicyclopentadiene with the aromatic hydrocarbon, the methyl substituted aromatic hydrocarbons or the tetra-hydronaphthalene respectively are bound to the carbon atoms of the original double bond of the dicyclopentadiene, said reaction product polymers having a mean molecular weight of from 300 to 5000, an iodine number (measured according to DIN Standard 53241, part 2) of from 0 to 10, and a melting point in the range of from 30° to 150° C.

4,255,298

ACRYLIC GRAFT COPOLYMERS AND COATING COMPOSITIONS THEREOF

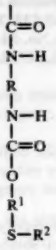
John A. Simms, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 972,425, Dec. 22, 1978, Pat. No. 4,206,294, which is a division of Ser. No. 820,879, Aug. 1, 1977, Pat. No. 4,151,227. This application Oct. 19, 1979, Ser. No. 87,463

Int. Cl.^{3} C08L *1/14, 1/10*

U.S. Cl. 260—17 A **5 Claims**

1. A graft copolymer consisting essentially of about 25–95%, by weight of a cellulosic polymer and about 5–75% by weight of side chains; wherein the cellulosic polymer backbone contained pendent hydroxyl groups before the attachment of side chains by replacement of a hydrogen of at least one of the hydroxyl groups by the formula



wherein R is an aliphatic group, a cycloaliphatic group or an aromatic group; R^1 is an alkylene group having 2–6 carbon atoms, R^2, which forms a side chain, is an acrylate polymer.

4,255,299

POLYMER CONTAINING PERFLUOROALKYL GROUP, PROCESS FOR PREPARING THE SAME AND COATING COMPOSITION

Shigeo Daimon, Osaka, and Kazuo Okamura, Itami, both of Japan, assignors to Daikin Kogyo Co., Ltd., Osaka, Japan

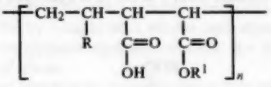
Filed Dec. 19, 1979, Ser. No. 105,259

Claims priority, application Japan, Dec. 29, 1978, 53-1653001

Int. Cl.^{3} C08F *8/24, 8/18, 222/06*

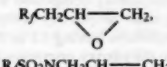
U.S. Cl. 260—17 R **6 Claims**

1. A polymer containing perfluoroalkyl groups in its side chains which is an addition reaction product of a polymer having the following general formula:

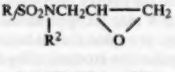


(I)

wherein R is a phenyl group or alkoxyl group having 1 to 12 carbon atoms, R^1 is an alkyl group having 1 to 12 carbon atoms, and n is an integer of 10 to 2,000, with an epoxy compound selected from the group consisting of

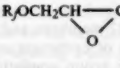


(IIa)



(IIb)

and



(IIc)

wherein R_f is a perfluoroalkyl group having 3 to 20 carbon atoms and R^2 is an alkyl group having 1 to 12 carbon atoms, the addition reaction product containing 0.1 to 50% by mole of the group derived from the epoxy compound per 1 mole of the recurring unit of the polymer having the formula (I).

4,255,300

COMPOSITION AND PROCESS FOR MAKING PRECIPITATED CELLULOSE-POLYVINYL ALCOHOL BICONSTITUENT COMPOSITION

Neal E. Franks, Suffern, N.Y., and Julianna K. Varga, Asheville, N.C., assignors to Akzona Incorporated, Asheville, N.C.

Continuation-in-part of Ser. No. 938,907, Sep. 1, 1978, Pat. No. 4,196,282, which is a continuation-in-part of Ser. No. 854,957, Nov. 25, 1977, Pat. No. 4,145,532. This application Jul. 2, 1979, Ser. No. 54,355

Int. Cl.³ C08L *1/02*

U.S. Cl. 260—17.4 CL **16 Claims**

1. A biconstituent dispersion comprising:

(A) a first distinct phase comprising a solution of

(1) cellulose

(2) a tertiary amine oxide cellulose solvent

(3) a cellulose solubility enhancing amount of water

(B) a second distinct phase comprising a solution of

(1) polyvinyl alcohol

(2) a tertiary amine oxide polyvinyl alcohol solvent

(3) a polyvinyl alcohol solubility enhancing amount of water,

said dispersion containing 0.8 to 29% water, and having the cellulose and polyvinyl alcohol present in a ratio of from about 1:99 to about 99:1.

4,255,301

GLYCOL CARBONATE ESTER STABILIZERS FOR SYNTHETIC RESINS

Motonobu Minagawa, Koshigaya; Yutaka Nakahara, Iwatsuiki, and Naohiro Kubota, Urawa, all of Japan, assignors to Argus Chemical Corporation, Brooklyn, N.Y.

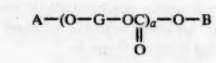
Filed May 10, 1978, Ser. No. 904,524

Claims priority, application Japan, May 10, 1977, 52-53586

Int. Cl.³ C08K *5/04*

U.S. Cl. 260—18 TN **24 Claims**

1. A stabilizer composition capable of enhancing the resistance to deterioration of a synthetic resin when exposed to light of wavelength less than 400 nanometers, and to heat comprising a carbonate ester of a cyclic dihydroxy compound represented by the formula



in which a is a number from 1 to 50, A is hydrogen or a group

B is a group R′ or a dihydroxy compound residue —G—OH, R and R′ independently of one another are alkyl, alkoxyalkyl, cycloalkyl, aryl, aryloxyalkyl, aralkyl, or alkaryl groups having 1 to 20 carbon atoms, and G independently at each occurrence is a residue of a dihydroxy compound selected from the group consisting of aliphatic dihydroxy compounds having 2 to 20 carbon atoms, bisphenols having 12 to 31 carbon atoms, and cyclic non-aromatic dihydroxy compounds having 3 to 20 carbon atoms and 0 to 4 ring oxygen atoms in 1 to 2 rings having 3 to 12 members, provided that at least one occurrence of G is a residue of a cyclic non-aromatic dihydroxy compound having 4 to 20 carbon atoms and 0 to 4 oxygen atoms disposed in 1 to 2 rings having 3 to 12 members, and 0.1 to 50 parts by weight per part by weight of carbonate ester of a polymer stabilizer selected from the group consisting of magnesium, calcium, strontium, barium, zinc and nickel salts of non-nitrogenous monocarboxylic acids having 6 to 24 carbon atoms; phenols; thiodipropionic acid esters; 1,2-epoxides; organic phosphites; 2-hydroxybenzophenones; 2(2′-hydroxyphenyl)benzo-1,2,3-triazoles; non-condensed aryl esters of non-condensed aromatic carboxylic acids; nickel phenolates and nickel ammine phenolates; alkylhydroxyphenylalkylenephosphonic acid esters and ester salts of magnesium, calcium, strontium, barium, zinc, and nickel; esters of alpha-cyanocinnamic acid and ring-substituted alpha-cyanocinnamic acids; and carboxylic acid esters of 2,2,6,6-tetraalkylpiperidine-4-alcohols having 15 to 75 carbon atoms and 2 to 8% by weight piperidine nitrogen.

19. A stabilized synthetic resin composition having enhanced resistance to deterioration when exposed to light of wavelength of less than 400 nanometers, comprising 100 parts by weight of a synthetic resin and 0.01 to 10 parts by weight of a stabilizer composition according to claim **1**.

4,255,302

RESIN SYSTEM FOR FILAMENT WINDING OF PRESSURE VESSELS

Leo G. Adams, Midvale, and Richard E. Hoffman, Sandy, both of Utah, assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Nov. 15, 1979, Ser. No. 95,126

Int. Cl.³ C08L *63/02, 63/00, 69/48, 77/10*

U.S. Cl. 260—18 EP **4 Claims**

1. A resin system composition for the filament winding of pressure vessels comprising the mixing of:

(a) Component A comprising diglycidyl ether of bisphenol A about 25% by weight and diglycidyl ester of linoleic dimer acid about 75% by weight;

(b) Component B comprising diglycidyl ether of butanediol;

(c) Component C comprising a mixture of methylenedianiline and metaphenylenediamine in a 60/40 ratio by weight; and

(d) wherein the parts by weight ratio of components A, B and C are about 100, 25, and 30 respectively.

2. The system of claim **1** wherein the filament winding includes:

(a) Component D which comprises Kevlar 49 filament having a denier of about 4600 and is about 500 parts by weight.

4,255,303

POLYETHYLENE COMPOSITION CONTAINING TALC FILLER FOR ELECTRICAL APPLICATIONS

Michael J. Keogh, Bridgewater, N.J., assignor to Union Carbide Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 899,563, Apr. 27, 1978, abandoned, which is a continuation-in-part of Ser. No. 800,899, May 26, 1977, abandoned. This application Apr. 25, 1979, Ser. No. 33,328

Int. Cl.³ C08K *9/04;* C08L *23/06*

U.S. Cl. 260—23 H **48 Claims**

1. A composition useful for coating wires or cables, having good electrical resistance, tensile strength and elongation consisting essentially of:

(a) ethylene polymer, and

(b) at least 10 parts by weight per 100 parts by weight of ethylene polymer of talc filler coated with at least one metallic salt of a fatty acid having 8 to 20 carbon atoms, wherein said metallic salt contains a metal selected from the metals of Groups Ia, IIa, and IIb of the Mendeleev Periodic Table of Elements.

4,255,304

NICKEL STABILIZERS AND DYE ENHANCERS FOR POLYOLEFINS

Robert J. Tucker, Hackettstown, N.J., assignor to American Cyanamid Company, Stamford, Conn.

Filed Jun. 6, 1979, Ser. No. 46,139

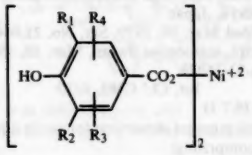
Int. Cl.³ C08K *5/52, 5/13, 5/10, 5/06*

U.S. Cl. 260—23 H **10 Claims**

1. In the preparation of polyolefin multifilament fibers by spinning a polyolefin and coating with a lubricant, wherein the

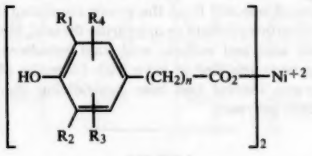
polyolefin has mixed therewith prior to spinning a reaction product of

(a) 30 to 90 parts by weight of a compound of Formula I:



wherein R_1 and R_2 are each alkyl radicals containing up to 8 carbon atoms, at least one of which is branched on the alpha carbon atom, R_3 and R_4 are each hydrogen or an alkyl radical containing up to 18 carbon atoms, and

(b) 70 to 10 parts by weight of a secondary or tertiary organic phosphite, and said lubricant discolors in the presence of said reaction product, the improvement comprising incorporating into said polyolefin prior to spinning a compound of Formula II:



wherein n is 1 to 3 and R_1 to R_4 are as defined and wherein said compound of Formula II is present as about 5 to 30 percent by weight of the total of said reaction product and said compound of Formula II.

4,255,305

COATING BATH COMPOSITION AND METHOD

John K. Howell, Jr., Rochester, Mich., assignor to Oxy Metal Industries Corporation, Warren, Mich.

Division of Ser. No. 764,120, Jan. 31, 1977, Pat. No. 4,180,603. This application Feb. 8, 1979, Ser. No. 10,343

Int. Cl.³ C08L *61/10, 61/28*

U.S. Cl. 260—29.3 **15 Claims**

1. An emulsion composition comprising a mixture of:

(1) water;

(2) an aqueous combination of epoxy resin solids, cross-linking resin solids, and an emulsifier in a resin-miscible water-immiscible solvent, in an amount to yield a resin solids content of from about 5 to about 500 grams per liter;

(3) hydrogen peroxide in an amount of from about 1 to about 5 grams per liter; and

(4) sufficient acid or base, if necessary, to adjust the pH of the emulsion to a value from about 2 to about 4.

4,255,306

VINYLIDENE CHLORIDE POLYMER MICROGELS

Dale S. Gibbs, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Sep. 15, 1978, Ser. No. 942,515

Int. Cl.³ C08F *14/08, 114/08, 214/08*

U.S. Cl. 260—29.6 H **15 Claims**

1. Discrete, crosslinked polymer microgels obtained by emulsion polymerizing (a) about 50 to about 95 parts by weight of vinylidene chloride, (b) about 5 to about 50 parts by weight of a copolymerizable ethylenically unsaturated comonomer, and (c) about 0.1 to about 10 parts by weight of a copolymerizable crosslinking polyfunctional comonomer; said polymer microgels having a latex particle size of less than 1 micron and a gel content of about 25 to 99 percent.

12. A coating latex containing discrete, crosslinked vinylidene chloride polymer microgels, said latex comprising the product obtained by emulsion polymerizing (a) about 88 to about 92 parts by weight of vinylidene chloride; (b) about 6 to about 12 parts by weight of methyl acrylate or methyl methacrylate; (c) about 1 to about 5 parts by weight of a copolymerizable crosslinking polyfunctional comonomer; and (d) about 1 to about 10 parts by weight of a comonomer selected from the group consisting of acrylic acid, methacrylic acid, itaconic acid, and fumaric acid, said microgels having a particle size of about 0.1 to about 0.5 micron, a gel content of about 25 to about 50 percent, and a second order transition temperature less than about 30° C.

4,255,307

REDUCING RESIDUAL ACRYLONITRILE IN WATER DISPERSIONS OF ACRYLONITRILE POLYMERS WITH ALKALI OR AMMONIUM SULFITE

James R. Miller, Richfield, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

Filed Nov. 1, 1978, Ser. No. 956,546

Int. Cl.³ C08L *33/20*

U.S. Cl. 260—29.6 PT **5 Claims**

1. A process for reducing the acrylonitrile content of an aqueous dispersion of an elastomer or plastic acrylonitrile polymer containing free acrylonitrile comprising adding to said dispersion at least a stoichiometric amount of an alkali or ammonium sulfite to react with said acrylonitrile.

4,255,308

WATER BASED ACRYLIC LACQUER COMPOSITION

Wallace R. Brasen, Chadds Ford, Pa., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 867,118, Jan. 5, 1978, abandoned. This application Jul. 12, 1979, Ser. No. 57,114

Int. Cl.³ C08L *33/10*

U.S. Cl. 260—29.6 RW **34 Claims**

1. An aqueous dispersion lacquer composition comprising about 5–60% by weight of a binder and about 40–95% by weight of an aqueous medium; wherein the binder consists essentially of about

a dispersed Polymer A consisting essentially of methyl methacrylate and having a weight average molecular weight of about 60,000 to 110,000 measured by gel permeation chromatography using polystyrene as a standard;

a dispersant Polymer B comprising methyl methacrylate, an alkyl acrylate or an alkyl methacrylate, each having 2–12 carbon atoms in the alkyl group, and an ethylenically unsaturated carboxylic acid and having a weight average molecular weight of about 20,000 to 70,000, measured as above; and

a graft copolymer comprising said dispersed Polymer A and dispersant Polymer B having a weight average molecular weight of about 50,000–80,000 measured as above; and

containing sufficient base to provide a pH of about 7–9; wherein a finish of the composition is not crosslinked as determined by forming a self-supporting 2 mil thick film by baking a film of the composition for about 2 hours at about 160° C. and immersing said baked film in methylene chloride at a temperature of about 20° C. for about 2 hours, said film being substantially disintegrated after immersion in methylene chloride.

4,255,309

POLYACRYLIC ACIDS AND METHYL VINYL ETHER/MALEIC ANHYDRIDE COPOLYMERS AS SOFT SCALE INHIBITORS

Frederick C. Klaessig, Doylestown, Pa., and Donald F. Jacques, Kingwood, Tex., assignors to Betz Laboratories, Inc., Trevose, Pa.

Filed Aug. 16, 1979, Ser. No. 66,953
Int. Cl.³ C08L *33/02*
U.S. Cl. 260—29.6 WB **12 Claims**

1. A method for inhibiting the precipitation of soft scale from black liquor, which method comprises adding to said black liquor an effective amount for the purpose of a treatment comprising in combination effective polyacrylic acid and effective methyl vinyl ether/maleic anhydride copolymer, wherein said treatment is added in an amount of from about 1 to about 500 parts per million parts of black liquor.

4,255,310

AQUEOUS PAINTS WHICH CONTAIN POLYGLYCIDYLAMINES AS ADDITIVES

Knut Oppenlaender, Ludwigshafen; Rainer Strickler, Heidelberg; Hans J. Geelhaar, Frankenthal; Josef Lamprecht; Erich Penzel, both of Ludwigshafen, and Gregor Ley, Wattenheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Aug. 9, 1979, Ser. No. 65,160
Claims priority, application Fed. Rep. of Germany, Aug. 23, 1978, 2836764
Int. Cl.³ C08L *31/04*
U.S. Cl. 260—29.6 T **17 Claims**

1. An aqueous dispersion paint which comprises:
a binder selected from the group consisting of homopolymers or copolymers or mixtures thereof; and
1–15% by weight based on said binder, of a polyglycidylamine carrying at least two glycidyl groups bonded to hydrogen-free nitrogen or salts thereof.

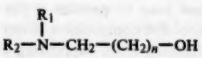
4,255,311

STORAGE-STABLE, FORMALDEHYDE-FREE COMPOSITION FOR THE TREATMENT OF TEXTILE MATERIAL CONTAINING HYDROXYL GROUPS

Sameer H. Eldin, and Hanspeter Gysin, both of Birsfelden, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation of Ser. No. 826,781, Aug. 22, 1977, abandoned. This application Nov. 26, 1979, Ser. No. 97,591
Claims priority, application Switzerland, Sep. 3, 1976, 11215/76
Int. Cl.³ C08L *33/02, 33/08, 63/00*
U.S. Cl. 260—29.6 NR **11 Claims**

1. Storage-stable, formaldehyde-free composition for the treatment of textile material containing hydroxyl groups, which composition contains
(a) 10 to 50 percent by weight of at least one water-soluble diglycidyl or triglycidyl hydantoin compound,
(b) 40 to 89.9 percent by weight of at least one acrylic copolymer, and in addition
(c) 0.1 to 12 percent by weight of an aliphatic polyamine containing ether groups and having exclusively primary amino groups, or of an alkanolamine of the formula I



(I)

wherein R_1 and R_2 independently of one another are hydrogen or the group $-CH_2-(CH_2)_n-OH$, and n is the number 1, 2, 3 or 4, with the percentages being relative to the total weight of the components (a), (b) and (c).

4,255,312

AQUEOUS PIGMENT DISPERSION USED FOR AQUEOUS COATING COMPOSITIONS

Yoshihiko Araki, Kawasaki; Hajime Hara, Fujisawa, and Kazuho Aoyama, Tokyo, all of Japan, assignors to Nippon Oil Co., Ltd., Tokyo, Japan

Filed Mar. 16, 1979, Ser. No. 21,064
Claims priority, application Japan, Mar. 18, 1978, 53-31264; Mar. 30, 1978, 53-36979
Int. Cl.³ C08L *9/10*
U.S. Cl. 260—29.7 H **10 Claims**

1. An aqueous pigment dispersion for use in aqueous coating compositions comprising:
(1) an organic or inorganic pigment;
(2) an amount of water within a range of 1/10–10 times by weight of said pigment; and
(3) an amount of a reactive dispersing agent within the range of 0.1–10% by weight of said pigment wherein said reactive dispersing agent consists essentially of a water-soluble base neutralized polymer prepared by acidifying the polymerized butadiene units of a polymer of butadiene having more than 50 mole percent butadiene units of which at least 50% are linked in 1,2 bonds and having a number average molecular weight for 300–10,000, with an acid compound selected from the group consisting of unsaturated dicarboxylic acid or anhydride thereof, SO_3, chlorosulfonic acid and sulfuric acid, said butadiene polymer having been acidified to have 0.05–1.5 moles of acid per 100 grams thereof and base neutralizing the acidified butadiene polymer.

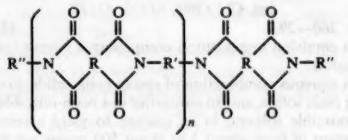
4,255,313

NOVEL END-CAPPED POLYIMIDE OLIGOMERS

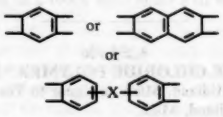
Patricia A. Antonoplos, Huntington Beach, Calif., and William J. Heilman, Houston, Tex., assignors to Gulf Oil Corporation, Pittsburgh, Pa.

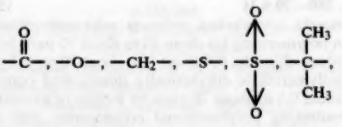
Filed Apr. 20, 1979, Ser. No. 31,729
Int. Cl.³ C08G *73/12*
U.S. Cl. 260—30.2 **15 Claims**

1. A product selected from the group consisting of:
A. An acetylene end-capped polyimide oligomer having the structure:



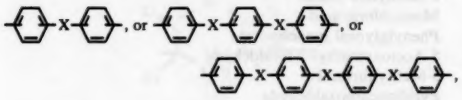
where R has the structure:





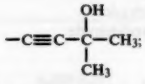
where X is
$-CF_2-$, or a bond, where R′ is selected from the group

consisting of a phenylene group, a naphthylene group, or

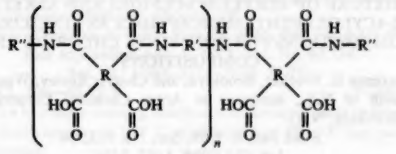


where X is as defined above; and

where R'' is an aryl group bearing a substituent having the structure:

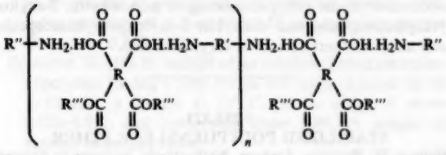


B. A first precursor of an acetylene end-capped polyimide oligomer of (A) having the structure:



where R, R' and R'' are as defined above; and

C. A second precursor of an acetylene end-capped polyimide oligomer of (A) having the structure:



where R, R' and R'' are as defined above and R''' is the alcohol moiety from which the diester of the aromatic tetracarboxylic acid was prepared where in each of the above formulas n has an average value from 1 to about 4.

4,255,314

METHOD FOR THE MANUFACTURE OF A VINYL CHLORIDE COPOLYMER SOLUTION

Shigeto Miyoshi, Shibukawa, and Toshio Kagami, Takasaki, both of Japan, assignors to Denki Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 12, 1979, Ser. No. 57,152

Int. Cl.[3] C08L *29/04*

U.S. Cl. 260—32.8 R **9 Claims**

1. A method for the manufacture of a vinyl chloride copolymer solution in which a vinyl chloride copolymer consisting of 50 to 90 wt% of vinyl chloride and 10 to 50 wt% of vinyl ester and having a mean polymerization degree of 100 to 800 is dissolved in an organic solvent and hydrolyzed in the presence of alcohol to obtain the vinyl chloride copolymer solution, characterized in that with the viscosity of the hydrolyzed solution of the vinyl chloride copolymer at 500 to 1000 CPS, the pressure is reduced to 100 to 200 Torr at a temperature below 60° C. to distil the alcohol and the organic solvent and then the pressure is increased to atmospheric pressure when the alcohol content in the hydrolyzed solution becomes less than 0.5 wt%.

4,255,315

METHOD OF MAKING A HIGH IMPACT POLYSTYRENE

Harry D. Anspon, Sewickley, PA, assignor to United States Steel Corporation, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 868,553, Jan. 11, 1978, abandoned. This application Mar. 23, 1979, Ser. No. 23,227

Int. Cl.[3] C08K *5/01*

U.S. Cl. 260—33.6 AQ **3 Claims**

1. Method of making polystyrene useful in sheet forming applications comprising:

(a) preparing a polymerization charge comprising about 7% to about 10% polybutadiene rubber having a cis content of at least 97%, and having a viscosity as a 5% solution in toluene of 70–95 cps at 25° C., about 1.3% to about 2.3% of a high boiling mineral oil containing at least 20% saturated naphthenic hydrocarbons, about 0 to about 0.62×10^{-4} mole mercaptan chain regulator per mole of styrene and the balance styrene,

(b) elevating the temperature of the charge to at least about 235° F. and below 250° F. and adding thereto about 0.27×10^{-4} mole to about 0.80×10^{-4} mole free radical peroxy catalyst per mole of styrene, said catalyst having a half-life of from about ½ hour to about 10 hours at 235°–250° F.,

(c) adding to the charge about 3.5×10^{-4} mole to about 4.73×10^{-4} mole of mercaptan chain regulator per mole of styrene within fifteen minutes after the initiation of mass polymerization on reaching a temperature selected from within the range of 235°–250° F.,

(d) maintaining the temperature of the polymerization charge between about 235° C. and 250° C. until phase inversion is complete and a suitable viscosity for suspension is reached,

(e) suspending the polymerization reaction mixture in water,

(f) adding about 4.55×10^{-4} mole to about 5.89 mole of a free radical peroxy catalyst per mole of styrene, and

(g) continuing the polymerization at temperatures of up to about 270° F. until at least 99.7% complete.

4,255,316

CERAMIFIABLE SILICONE ADHESIVES

John D. Blizzard, Bay City, Mich., assignor to Dow Corning Corporation, Midland, Mich.

Filed Apr. 26, 1979, Ser. No. 33,353

Int. Cl.[3] C08L *83/06;* C04B *35/14*

U.S. Cl. 260—37 SB **3 Claims**

1. A silicone adhesive composition ceramifiable to a quartz-free ceramic and suitable for adhering a plurality of greenware components together to provide a composite greenware article which can be fired to a unitary ceramic article, said composition consisting essentially of

(I) a silicone pressure-sensitive adhesive consisting essentially of

(A) 45 to 55 parts by weight of a polydiorganosiloxane fluid having the average formula $YO(R_2SiO)_nY$ wherein each R denotes, independently, a monovalent hydrocarbon radical having from 1 to 6 inclusive carbon atoms, at least 90 percent of all R radicals being methyl radicals, y denotes an endblocking radical and n has an average value so that the polydiorganosiloxane fluid has a viscosity of from 1 to 1000 pascal-seconds at 25° C., and

(B) 45 to 55 parts by weight of a xylene-soluble resin copolymer consisting essentially of $R_3SiO_{\frac{1}{2}}$ siloxane units and $SiO_{4/2}$ siloxane units in a mol ratio of from 0.6 to 0.9 $R_3SiO_{\frac{1}{2}}$ units for each $SiO_{4/2}$ unit, wherein each R denotes, independently, a monovalent hydrocarbon

radical having from 1 to 6 inclusive carbon atoms, the total of (A) plus (B) being 100 parts by weight, and

(II) 100 to 400 parts by weight, for every 100 parts by weight of (A) plus (B), of a volatile-free ceramifiable filler having a softening point above 800° C. and consisting of a mixture of 55.6 percent by weight SiO_2, 22.2 percent by weight Al_2O_3 and 22.2 percent by weight MgO.

4,255,317

NON-DISCOLORING GLASS STRAND SIZE

Thomas A. Coakley, Heath; John E. Rubadue, Columbus; Carl E. Forman, Heath, and Robert A. Schweizer, Granville, all of Ohio, assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Continuation-in-part of Ser. No. 844,253, Oct. 21, 1977, abandoned, which is a continuation of Ser. No. 741,181, Nov. 12, 1976, abandoned. This application Nov. 20, 1978, Ser. No. 962,404

Int. Cl.³ C08K *9/06*

U.S. Cl. 260—37 N **16 Claims**

1. A glass fiber having at least a portion of its surface in contact with the dried residue of an aqueous composition comprising:

(a) an emulsion of a thermoplastic aliphatic polyurethane produced by the chain extension of an NCO-terminated prepolymer prepared by the reaction of an aliphatic or cycloaliphatic diisocyanate with a polyalkylene ether polyol, and

(b) a silane coupling agent.

4,255,318

FIRE-RETARDANT PUTTY-LIKE COMPOSITIONS

Tamotsu Kaide; Toshikazu Gozen, both of Takarazuka; Jinichi Taniguchi, Takatsuki, and Yutaka Ohta, Amagasaki, all of Japan, assignors to Dainichi-Nippon Cables, Ltd., Amagasaki, Japan

Filed Jul. 17, 1979, Ser. No. 58,334

Int. Cl.³ C08K *7/14*

U.S. Cl. 260—42.18 **25 Claims**

1. A fire-retardant putty-like composition comprising (a) 100 parts by weight of a curable polychloroprene in a liquid state at room temperature, (b) about 200 to about 700 parts by weight of a hydrated metallic oxide, and (c) about 20 to about 100 parts by weight of a heat-resistant fibrous material, the composition containing the hydrated metallic oxide (b) and the heat-resistant fibrous material (c) in a combined amount of at least about 250 parts by weight per 100 parts by weight of the polychloroprene (a).

4,255,319

POLYMERIC COMPOSITIONS CONTAINING ELEMENTAL RED PHOSPHORUS, ALDEHYDES OR KETONES OR MIXTURES THEREOF

Edward N. Peters, Piscataway, N.J., assignor to Union Carbide Corporation, New York, N.Y.

Filed Dec. 15, 1978, Ser. No. 969,877

Int. Cl.³ C08K *3/32*

U.S. Cl. 260—45.7 P **8 Claims**

1. A polymeric composition comprising a thermoplastic or thermoset polymer, elemental red phosphorus and an aldehyde selected from the group consisting of:

Acetaldehyde
Decyl aldehyde
2-Ethylbutyaldehyde
Anisaldehyde
Benzaldehyde
4-Biphenylcarboxaldehyde
5-Bromosalicylaldehyde
5-Bromovanillin
2-Chloro-4 dimethylaminobenzaldehyde
Glyoxal
Heptaldehyde
Glutaraldehyde
Terephthaldehyde
Hexanal
2-Methylundecanal
Mucochloric acid
Phenylglyoxal monohydrate
5-Acetoxymethyl-2-furaldehyde
5-Methylfurfural
Pyridinecarboxaldehyde
Piperonal
m-tolualdehyde
Vanillin
Salicylaldehyde
Phenylacetaldehyde
Dibromosalicylaldehyde
Dimethylaminobenzaldehyde
Helicin
Nitropiperonal

their derivatives, their polymeric forms and mixtures thereof.

4,255,320

MIXTURE OF ALKYLTIN SULFIDES AND ALKYLTIN 2-ACYLOXYETHYLMERCAPTIDES AS STABILIZER COMPOSITIONS FOR POLYVINYL CHLORIDE RESIN COMPOSITIONS

Lawrence R. Brecker, Brooklyn, and Charles Keeley, Wantagh, both of N.Y., assignors to Argus Chemical Corporation, Brooklyn, N.Y.

Filed Jun. 8, 1978, Ser. No. 913,936

Int. Cl.³ C08K *5/57, 5/58*

U.S. Cl. 260—45.75 **26 Claims**

1. A stabilizer mixture for extrudable rigid polyvinyl chloride resin compositions effective in inhibiting the development of early discoloration when the composition is heated at 375° F., comprising at least one alkyltin 2-acyloxyethylmercaptide selected from the group consisting of monoalkyltin 2-acyloxyethylmercaptides and dialkyltin 2-acyloxyethylmercaptides and mixtures thereof, and an alkyltin sulfide.

4,255,321

STABILIZED POLYPHENYLENE ETHER

Reinier W. Brussen, Arnhem, Netherlands, assignor to General Electric Company, Pittsfield, Mass.

Filed Jan. 2, 1970, Ser. No. 385

The portion of the term of this patent subsequent to Mar. 10, 1996, has been disclaimed.

Int. Cl.³ C08K *3/30;* **C08L** *25/06, 71/04*

U.S. Cl. 260—45.75 W **3 Claims**

1. A stabilized polyphenylene ether composition comprising from 40 to 60 parts by weight of poly-(2,6-dimethyl-1,4-phenylene)ether, from 40 to 60 parts of a high impact strength polystyrene, at least 0.01 percent by weight of an inorganic metal sulfide and also containing zinc oxide in an amount of from 0.1 to 1.0 parts by weight per 100 parts of the composition.

4,255,322

BLENDS OF IMIDE POLYMERS AND VINYL CHLORIDE POLYMERS

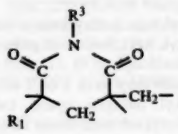
Richard M. Kopchik, Southampton, Pa., assignor to Rohm and Haas Company, Philadelphia, Pa.

Filed Feb. 19, 1980, Ser. No. 122,170

Int. Cl.³ C08L *39/04*

U.S. Cl. 260—45.75 K **11 Claims**

1. A compatible, impact modifiable composition comprising a blend of vinyl chloride polymer and glutarimide polymer containing units of the structural formula



wherein R_1, R_2, and R_3 independently represent hydrogen or C_1 to C_{20} unsubstituted or substituted alkyl, aryl or mixtures thereof, the weight ratio of said polymers being about 5:95 to 95:5.

4,255,323

EXTRUSION COATING COMPOSITIONS FOR WOVEN AND NON-WOVEN POLYOLEFIN SUBSTRATES AND ARTICLES THEREOF

Edward Barkis; Robert R. Crummer, both of Marietta, and James M. Joyner, East Point, all of Ga., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Division of Ser. No. 671,068, Mar. 29, 1976, Pat. No. 4,211,692. This application Aug. 1, 1979, Ser. No. 62,774

Int. Cl.³ C08K *5/13, 5/49, 53/00*

U.S. Cl. 260—45.75 N **5 Claims**

1. An extrusion coating composition having a shear independent melt viscosity at 190° C. of above about 380,000 centipoise comprising:

(a) about 30—75% by weight of an olefin polymer blend containing about 40 to 99 percent by weight of an ethylene-propylene block copolymer comprising at least about 80 percent by weight of polymerized propylene having a flow rate of about 15 dg/min. to 100 dg/min. and about 1 to 60 percent by weight of polyethylene having a melt index recovery of at least about 50 and a density greater than about 0.912, and

(b) about 70–25% by weight of an ethylene-isobutylacrylate copolymer having a flow rate in the range of about 50–90 g/10 min., a density at 23° C. in the range of about 0.920–0.930, and comprising about 30% by weight of reacted isobutylacrylate.

4,255,324

SYNERGISTIC FLAME RETARDANT COMPOSITIONS FOR POLYPHENYLENE ETHER RESINS

Albrecht H. Granzow, Somerset, and Christos Savides, Piscataway, both of N.J., assignors to American Cyanamid Company, Stamford, Conn.

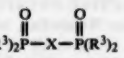
Filed Oct. 18, 1979, Ser. No. 86,210

Int. Cl.³ C08K *5/53*

U.S. Cl. 260—45.85 T **13 Claims**

1. A flame retardant composition comprising a homogeneous blend of polymers containing about 10 to 90 parts by weight of polyphenylene ether resin, about 90 to 10 parts by weight of polystyrene, and a flame-retarding effective amount of a mixture of (A) a phosphine compound (I):

wherein R^1 and R^2 are each selected from alkyl of 4 to 12 carbon atoms, cycloalkyl of 5 to 8 carbon atoms, phenyl, halophenyl containing 1 to 3 halogen atoms, omega-cyanoalkyl containing 1 to 4 carbon atoms, and benzyl; or (II):

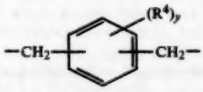


wherein R^3 is selected from cycloalkyl of 5 to 8 carbon atoms or omega-cyanoalkyl of 1 to 4 carbon atoms, and X is selected from

(a)

wherein n is an integer from 1 to 6;

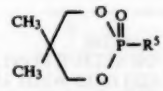
(b) the group



wherein R^4 is alkyl of 1 to 4 carbon atoms and y is an integer from 0 to 4; and

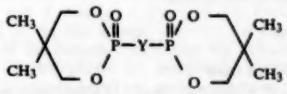
(c) the group

and (B) a phosphonate compound (III):



(III)

wherein R^5 is selected from phenyl, benzyl, or alkylbenzyl containing 1 to 3 alkyl groups of 1 to 4 carbon atoms; or (IV):



(IV)

wherein Y is

wherein R^6 is alkyl of 1 to 4 carbon atoms and x is an integer from 0 to 4; said mixture containing said component (A) and (B) in a weight ratio of from about 1:3 to 3:1.

4,255,325
REACTIVE DYESTUFFS

Wolfgang Harms; Klaus Wunderlich, both of Leverkusen, and Klaus van Oertzen, Cologne, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Nov. 14, 1978, Ser. No. 960,706

Claims priority, application Fed. Rep. of Germany, Nov. 16, 1977, 2751137

Int. Cl.[3] **C09B** *45/00, 29/22, 29/36*

U.S. Cl. 260—146 T **16 Claims**

1. Reactive dyestuffs of the formula

D-(T)$_m$

wherein

D = the radical of an organic dyestuff,

m = 1–4 and

T =

wherein

X and Y = a direct bond or a bridge member,

W =

or -O-,

acyl = an acyl radical and

R_1–R_3 = H, alkyl or aralkyl,

the radical T being bonded, via X to a C atom of an aromatic-carbocyclic or aromatic-heterocyclic ring of the chromophore.

4,255,326
NITROGEN AND/OR SULFUR CONTAINING HETEROCYCLIC AZO DYES WITH ANILINE, TETRAHYDROQUINOLINE AND BENZOMORPHOLINE COUPLERS HAVING SULFATE GROUP

Ralph R. Giles, and Max A. Weaver, both of Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Mar. 30, 1979, Ser. No. 25,685

Int. Cl.[3] **C09B** *29/08, 29/26, 29/36;* **D06P** *3/24*

U.S. Cl. 260—152 **32 Claims**

1. A compound of the formula

R—N=N—C

wherein R is selected from

benzothiazol-2-yl which may have 1–3 substituents selected from lower alkyl, lower alkoxy, thiocyano, lower alkylthio, cyano, carbamoyl, lower alkylcarbamoyl, lower alkoxycarbonyl, acyl, lower alkylsulfonyl, sulfamoyl, SO_2NH(lower alkyl), SO_2N(di-lower alkyl), lower alkylsulfonamido, acylamido, halogen, trifluoromethyl and SO_3(aryl);

2,1-benzisothiazol-3-yl which may have 1–3 substituents selected from lower alkyl, lower alkoxy, chlorine, bromine, SO_2NH_2, SO_2NH(lower alkyl), and SO_2N(di-lower alkyl);

1,3,4-thiadiazol-2-yl which may have a substituent selected from lower alkyl, lower alkoxy, halogen, lower alkylsulfonyl, SO_2NH_2, SO_2NH(lower alkyl), SO_2N (di-lower alkyl), arylsulfonyl, acylamido, aryl, arylthio, lower alkenylthio, cyclohexylthio, thiocyano, cyclohexylsulfonyl, lower alkylthio, and cyclohexyl;

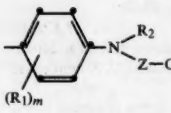
1,2,4-thiadiazol-5-yl which may have a substituent selected from lower alkyl, aryl, lower alkylthio, cyclohexylthio, and lower alkylsulfonyl;

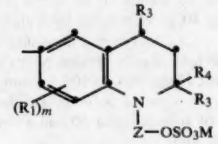
isothiazol-5-yl which may have 1 or 2 substituents selected from lower alkyl, halogen, cyano, carbamoyl, CONH lower alkyl, alkoxycarbonyl, lower alkylthio, lower alkenylthio, arylthio, cyclohexylthio, s-heterocycle, aryloxy, and lower alkoxy;

pyrazol-5-yl which may have 1 or 2 substituents selected from lower alkyl, lower alkoxycarbonyl, lower alkylthio, aryl, cyano, carbamoyl, lower alkylcarbamoyl, and lower alkylsulfonyl, and the hydrogen on the N may be replaced with lower alkyl, aryl of 6–10 carbons, lower alkylsulfonyl, arylsulfonyl, lower alkanoyl, or lower alkoxycarbonyl; and

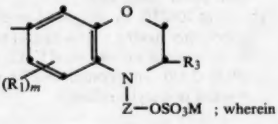
thiophen-2-yl which may be substituted with 1–3 groups selected from lower alkyl, cyano, lower alkoxycarbonyl, acyl, lower alkylsulfonyl, arylsulfonyl, carbamoyl, lower alkylcarbamoyl, aryl, halogen, sulfamoyl, lower alkylsulfamoyl and formyl; and

the coupler C is selected from those of the formulae:





and



; wherein

wherein

R_1 is selected from hydrogen, lower alkyl, lower alkoxy, halogen, acylamido, lower alkylthio, and aryloxy;

R_2 is selected from hydrogen, aryl, cycloalkyl, lower alkenyl and lower alkyl;

R_3 and R_4 are each selected from hydrogen and lower alkyl;

m is 0, 1 or 2; M is Na^+, K^+, H^+ or NH_4^+;

Z is selected from straight or branched chain lower alkylene and divalent groups of the formula $—CH_2(CH_2)_nX—CH_2(CH_2)_p—$, where n is 1, 2 or 3, p is 0, 1, 2 or 3, and X is O, S, SO_2, $—SO_2NH—$, $—SO_2N$(lower alkyl)—, —N(SO_2 lower alkyl)—, —N(SO_2 aryl)—, —NHCO—, —NHCONH—, and —CON(lower alkyl);

and in the above definition of X, Z, R, R_1, and R_2, any lower alkyl, lower alkylene, or cyclic radicals may bear up to three substituents selected from hydroxy, lower alkoxy, aryl, aryloxy, cyclohexyl, furyl, lower alkylcyclohexyl, aroyloxy, lower alkoxycarbonyl, lower alkanoyloxy, sulfamoyl, SO_2NH(aryl), SO_2NH(lower alkyl), SO_2N(di-lower alkyl), NHCOO(lower alkyl), NHCONH(lower alkyl), acylamido, lower alkylsulfonamido, succinimido, glutarimido, phthalimido, 2-pyrrolidono, cyano, carbamoyl, lower alkylcarbamoyl, lower alkoxyalkoxy, lower alkylthio, halogen, arylthio, lower alkylsulfonyl and arylsulfonyl.

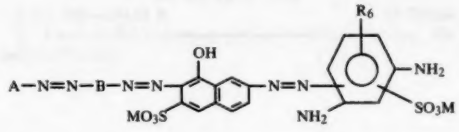
4,255,327

DIRECT BLACK DYE

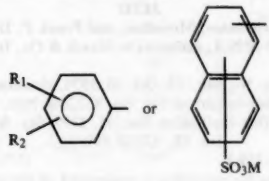
David A. Brode, Birdsboro, Pa., assignor to Crompton & Knowles Corporation, New York, N.Y.

Filed Mar. 27, 1979, Ser. No. 24,256
Int. Cl.[3] C09B 31/16; C09H 31/16
U.S. Cl. 260—173 4 Claims

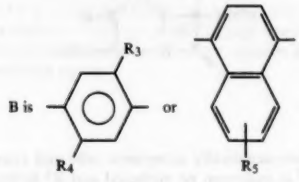
1. A tri or tetrasulfonic compound having the structure



where A is



where R_1 is H, SO_3M, lower alkyl, lower alkoxy, halogen, COOM, NHCO lower alkyl, NHCOCOOM, NO_2 or CN and R_2 is H, SO_3M, lower alkyl, lower alkoxy, halogen or COOM;



wherein R_3 is H, lower alkyl or lower alkoxy; R_4 is H, lower alkyl, lower alkoxy or NHCO lower alkyl; R_5 is H or SO_3M; R_6 is H or lower alkyl and M is H, Na, K, Li, NH_4 or a mono, di or tri alkanol amine.

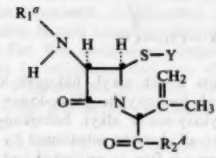
4,255,328

SULFIDE INTERMEDIATES FOR THE MANUFACTURE OF ENOL DERIVATIVES

Robert B. Woodward, Cambridge, Mass., and Hans Bickel, Binningen, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

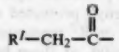
Division of Ser. No. 746,927, Dec. 2, 1976, Pat. No. 4,147,864, which is a continuation of Ser. No. 551,483, Feb. 2, 1975, abandoned. This application Nov. 20, 1978, Ser. No. 962,425
Claims priority, application Switzerland, Feb. 26, 1974, 2693/74; Jun. 5, 1974, 7766/74; Aug. 12, 1974, 11000/74
Int. Cl.[3] C07D 205/08, 401/06, 403/06, 405/06
U.S. Cl. 260—239 A 29 Claims

1. A compound of the formula



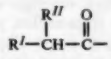
(IV)

wherein R_1^a represents an acyl group of the formula



(A'),

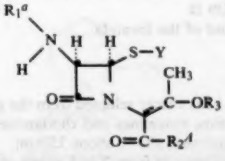
wherein R^I represents lower alkyl, halogeno-lower alkyl, phenyloxy-lower alkyl, hydroxyphenyloxy-lower alkyl, protected hydroxyphenyloxy-lower alkyl, halogeno-phenyloxy-lower alkyl, or lower alkyl mono-substituted by amino and carboxyl, wherein amino is free or protected and carboxyl is free or protected, or R^I represents lower alkenyl, phenyl, hydroxyphenyl, protected hydroxyphenyl, halogeno-phenyl, hydroxy-halogeno-phenyl, protected hydroxy-halogeno-phenyl, amino-lower alkyl-phenyl, protected amino-lower alkyl-phenyl, phenyloxyphenyl, or R^I represents pyridyl, thienyl, furyl, imidazolyl or tetrazolyl, or these heterocyclic groups mono-substituted by lower alkyl, amino, protected amino, aminomethyl or protected aminomethyl, or R^I represents lower alkoxy, phenyloxy, hydroxyphenyloxy, protected hydroxyphenyloxy, halogenophenyloxy, lower alkyl-thio, lower alkenylthio, phenylthio, pyridylthio, 2-imidazolylthio, 1,2,4-triazol-3-ylthio, 1,3,4-triazol-2-ylthio, 1,2,4-thiadiazol-3-ylthio, 1,3,4-thiadiazol-2-ylthio, or 5-tetrazolylthio, and these heterocyclylthio groups, mono-substituted by lower alkyl, or R^I represents halogeno, lower alkoxycarbonyl, cyano, carbamoyl, N-lower alkylcarbamoyl, N-phenylcarbamoyl, lower alkanoyl, benzoyl, or azido, or R_1^a represents an acyl group of the formula



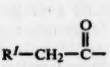
(A''),

wherein R^I represents lower alkyl, phenyl, hydroxyphenyl, protected hydroxyphenyl, halogenophenyl, hydroxy-halogeno-phenyl, protected hydroxy-halogeno-phenyl, furyl, thienyl, or isothiazolyl, or 1,4-cyclohexadienyl, and R^{II} represents amino, protected amino, azido, carboxyl, protected carboxyl, cyano, sulpho, hydroxyl, protected hydroxyl, O-lower alkyl-phosphono, O,O'-di-lower alkylphosphono or halogeno, R_2^A represents a group which together with the carbonyl grouping —C(=O)—forms an esterified, protected carboxyl group, and Y denotes a group of the formula $—SO_2—R_5$ bonded to the thio group —S— by the sulphur atom, or a group of the formula $—S—SO_2—R_5$, wherein R_5 is an aliphatic, cycloaliphatic or araliphatic hydrocarbon radical which is unsubstituted or mono-substituted by lower alkyl, lower alkoxy, halogen, phenyl, phenyloxy or nitro, and which radical R_5 has up to 18 carbon atoms.

2. A compound of the formula

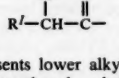


wherein R_1^a represents an acyl group of the formula



(A'),

wherein R^I represents lower alkyl, halogeno-lower alkyl, phenyloxy-lower alkyl, hydroxyphenyloxy-lower alkyl, protected hydroxyphenyloxy-lower alkyl, halogeno-phenyloxy-lower alkyl, or lower alkyl mono-substituted by amino and carboxyl, wherein amino is free or protected and carboxyl is free or protected, or R^I represents lower alkenyl, phenyl, hydroxyphenyl, protected hydroxyphenyl, halogenophenyl, hydroxy-halogeno-phenyl, protected hydroxy-halogeno-phenyl, amino-lower alkyl-phenyl, protected amino-lower alkyl-phenyl, phenyloxyphenyl, or R^I represents pyridyl, thienyl, furyl, imidazolyl or tetrazolyl, or these heterocyclic groups mono-substituted by lower alkyl, amino, protected amino, aminomethyl or protected aminomethyl, or R^I represents lower alkoxy, phenyloxy, hydroxyphenyloxy, protected hydroxyphenyloxy, halogenophenyloxy, lower alkylthio, lower alkenylthio, phenylthio, pyridylthio, 2-imidazolylthio, 1,2,4-triazol-3-ylthio, 1,3,4-triazol-2-ylthio, 1,2,4-thiadiazol-3-ylthio, 1,3,4-thiadiazol-2-ylthio, or 5-tetrazolylthio, and these heterocyclylthio groups, mono-substituted by lower alkyl, or R^I represents halogeno, lower alkoxycarbonyl, cyano, carbamoyl, N-lower alkylcarbamoyl, N-phenylcarbamoyl, lower alkanoyl, benzoyl, or azido, or $R_1{}^a$ represents an acyl group of the formula



(A''),

wherein R^I represents lower alkyl, phenyl, hydroxyphenyl, protected hydroxyphenyl, halogenophenyl, hydroxy-halogeno-phenyl, protected hydroxy-halogeno-phenyl, furyl, thienyl, or isothiazolyl, or 1,4-cyclohexadienyl, and R^{II} represents amino, protected amino, azido, carboxyl, protected carboxyl, cyano, sulpho, hydroxyl, protected hydroxyl, O-lower alkyl-phosphono, O,O'-di-lower alkyl-phosphono or halogeno, $R_2{}^A$ represents a group which together with the carbonyl grouping —C(=O)— forms an esterified, protected carboxyl group, R_3 represents hydrogen, lower alkyl, α-phenyl-lower alkyl, α,α-diphenylmethyl or tri-lower alkyl silyl, and Y represents a leaving group of the formula —S—R_4, wherein R_4 is 1-methyl-imidazol-2-yl, 1,3-thiazol-2-yl, 1,3,4-thiadiazol-2-yl, 1,3,4,5-thiatriazol-2-yl, 1,3-oxazol-2-yl, 1,3,4-oxadiazol-2-yl, 1,3,4,5-oxatriazol-2-yl, 2-quinolyl, 1-methyl-benzimidazol-2-yl, benzthiazol-2-yl or benzoxazol-2-yl, or Y represents a leaving group of the formula —SO_2—R_5, wherein R_5 represents phenyl, or phenyl mono-substituted by lower alkyl, lower alkoxy, halogen, phenyl, phenyloxy, or nitro.

4,255,329

DOUBLE RECEPTOR FLUORESCENT IMMUNOASSAY

Edwin F. Ullman, Atherton, Calif., assignor to Syva Company, Palo Alto, Calif.

Division of Ser. No. 751,838, Dec. 17, 1976, Pat. No. 4,161,515, which is a continuation-in-part of Ser. No. 402,693, Oct. 2, 1973, Pat. No. 3,998,943. This application Apr. 2, 1979, Ser. No. 26,393

Int. Cl.³ C07J *71/00*

U.S. Cl. 260—239 D **7 Claims**

2. A compound of the formula:

Hap-X-Fl

wherein Fl is a fluorescer selected from the group consisting of fluoresceins, rosamines and rhodamines having an absorption maximum above about 350nm;

X is a linking group of from 2 to 8 atoms other than hydrogen, which are carbon, nitrogen, oxygen and sulfur and having a non-oxo-carbonyl functionality forming an ester or amide; and

Hap is an haptenic drug selected from the group consisting of morphine, triiodothyronine of from 3 to 4 iodo groups, diphenylhydantoin, phenobarbital, dibenzazepine and 3-ketodigoxigenin.

4,255,330

PROCESS FOR PREPARING 6-SUBSTITUTED AMINO-2-SUBSTITUTED-PEN-2-EM-3-CARBOXYLIC ACID

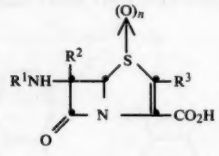
Burton G. Christensen, Metuchen, and Frank P. DiNinno, Old Bridge, both of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Division of Ser. No. 948,712, Oct. 10, 1978, abandoned, which is a continuation-in-part of Ser. No. 852,274, Nov. 17, 1977, abandoned. This application Dec. 31, 1979, Ser. No. 108,605

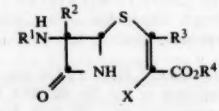
Int. Cl.³ C07D *499/04*

U.S. Cl. 260—239.1 **2 Claims**

1. A process for preparing a compound of the structure:



and the pharmaceutically acceptable salts and esters thereof wherein R^2 is hydrogen or methoxyl and R^1 is hydrogen or acyl and R^3 is hydrogen, —R, —OR, —SR, —NR_2; wherein R is substituted or unsubstituted: alkyl having 1–6 carbon atoms, phenyl, phenylalkyl having 7–12 carbon atoms, heterocyclyl and heterocyclylalkyl wherein the alkyl has 1–3 carbon atoms and the heterocycle has 1–4 hetero atoms selected from O, N and S; and wherein the chain or nuclear substituent on R is selected from amino, mono-, di- and trialkylamino (each alkyl having 1–6 carbon atoms), hydroxyl, alkoxyl, having 1–6 carbon atoms, mercapto, alkylthio having 1–3 carbon atoms, phenylthio, sulfamoyl, amidino, guanidino, nitro, chloro, bromo, fluoro, cyano and carboxyl; n is 0 or 1; when n=1, R^3 is not —SR; comprising cyclizing:



in the presence of a strong base in the presence of a metal complex coupling agent; wherein R^4 is a protecting group or a pharmaceutically acceptable ester moiety and X is halo.

4,255,331
3-ACETOXY-9β-11β-EPOXY-DIENES AND THE PREPARATION OF THE CORRESPONDING 6α-HALOGEN-4-ENE-3-ONES

Peter MacDonald, Arese, Italy, assignor to Prochem Establishment, Balzers, Liechtenstein

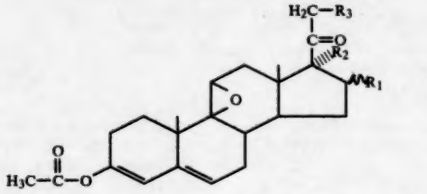
Filed Apr. 3, 1979, Ser. No. 26,677

Claims priority, application Netherlands, Apr. 5, 1978, 7803655; Apr. 5, 1978, 7803656; Mar. 23, 1979, 7902333

Int. Cl.³ C07J *71/00*

U.S. Cl. 260—239.55 R 14 Claims

1. 3-acetoxy-9β,11β-epoxy-pregna-3,5-dienes having the general formula:



in which R_3 is a hydrogen or halogen atom or a hydroxy, acyloxy-, aroyloxy- or sulphonyloxy group; and in which R_1 which may be α- or β-, and/or R_2 are a hydrogen atom or a hydroxy-, aroyloxy-, acyloxy or alkyl group containing 1–6 carbon atoms, or in which R_1 and R_2 form together a 16,17-isopropylidene-dioxy group.

4,255,332
PROCESS FOR THE PREPARATION OF POTASSIUM CLAVULANATE FROM LITHIUM CLAVULANATE

Richard V. Davies, Worthing, England, assignor to Beecham Group Limited, England

Filed Aug. 23, 1978, Ser. No. 935,887

Claims priority, application United Kingdom, Sep. 1, 1977, 36567/77

Int. Cl.³ C07D *498/04*

U.S. Cl. 260—245.3 15 Claims

1. A process for the preparation of potassium clavulanate which process comprises contacting a concentrated solution of lithium clavulanate in water or in water in admixture with one or more suitable miscible organic solvents with a concentrated solution of potassium fluoride, potassium orthophosphate, potassium metaphosphate, potassium carbonate or potassium bicarbonate, separating off the resulting precipitated lithium fluoride, lithium orthophosphate, lithium metaphosphate or lithium carbonate and thereafter recovering the potassium clavulanate from solution.

4,255,333
PREPARATION OF INDOLENINES

Hans-Joachim Opgenorth, Frankenthal; Horst Scheuermann, Ludwigshafen; Harald Laas, Maxdorf, and Axel Nissen, Leimen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

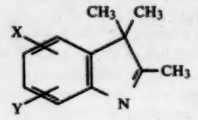
Filed Jan. 30, 1979, Ser. No. 7,773

Claims priority, application Fed. Rep. of Germany, Feb. 10, 1978, 2805620

Int. Cl.³ C07D *209/08*; C07C *119/10*

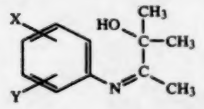
U.S. Cl. 260—319.1 8 Claims

1. A process for the preparation of an indolenine of the formula:

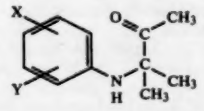


wherein, independently of one another, X is hydrogen, chlorine, bromine, cyano, C_1–C_4 alkyl, C_1–C_4 alkoxy, C_1–C_4 alkoxycarbonyl, nitro or C_1–C_4 alkylsulfonyl and Y is hydrogen, chlorine, bromine or methyl, comprising:

thermally rearranging a Schiff base of the formula (II)



at a temperature of 150° to 300° C. to a compound of the formula (III)



and cyclizing said compound (III) to said indolenine at a temperature of 100° to 250° C. in the presence of a catalyzing amount of an acid catalyst sufficient to effect said cyclization.

4,255,334
PROCESS FOR PREPARING 3-AZABICYCLO(3.1.0)HEXANE-2-CARBOXYLIC ACID

Janet A. Day, Gillingham; Barry R. J. Devlin, Sittingbourne, and Robert J. G. Searle, Rodmersham Green, all of England, assignors to Shell Oil Company, Houston, Tex.

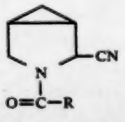
Filed Jun. 18, 1979, Ser. No. 49,374

Claims priority, application United Kingdom, Jun. 27, 1978, 27978/78

Int. Cl.³ C07D *207/20*, *207/22*

U.S. Cl. 260—326.5 B 4 Claims

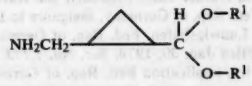
1. A compound of the formula:



wherein R is alkyl of two to five carbon atoms.

3. A process for preparing a compound of claim 1 which

comprises treating, at a temperature of from about 40° C. to about 120° C., an acetal of the formula



wherein each R^1 is alkyl of from one to four carbon atoms, said compound being in the cis-isomeric configuration, with up to ten percent stoichiometric excess of a cyanide in the presence of a stoichiometric excess of an alkanecarboxylic acid of two to five carbon atoms, optionally also in the presence of a solvent selected from one or both of (a) excess of the alkanecarboxylic acid, and (b) ethers and aliphatic nitriles, optionally also in the presence of from 0.3 to 10 percent by weight of the acetal of an alkyl or arylsulfonic acid, as catalyst.

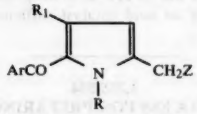
4,255,335

PREPARATION OF 5-AROYL-1-LOWERALKYLPYRROLE-2-ACETIC ACID DERIVATIVES

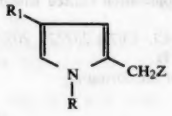
John R. Carson, Norristown, Pa., assignor to McNeilab, Inc., Fort Washington, Pa.

Filed Apr. 3, 1980, Ser. No. 137,046
Int. Cl.³ C07D *207/337*
U.S. Cl. 260—326.47 **3 Claims**

1. The process of preparing 5-aroyl-1-loweralkylpyrrole-2-acetic acid derivatives of formula:



which comprises reacting an aroylcyanide of formula: Ar-COCN with a 1-loweralkylpyrrole-2-acetic acid derivative of the formula:



said reaction being carried out by heating at a temperature above 100° C., wherein in the foregoing formulae:

R is loweralkyl;

R_1 is hydrogen or loweralkyl;

Ar is phenyl or phenyl substituted with a substituent selected from the group consisting of loweralkyl, halo, nitro, methylthio, trifluoromethyl and alkoxy;

Z is —CN or —CO_2 loweralkyl.

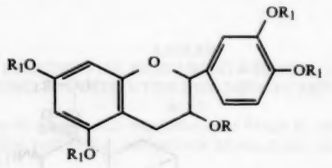
4,255,336

PROCESS FOR THE PREPARATION OF O-SUBSTITUTED DERIVATIVES OF (+)-CYANIDAN-3-01

Alban Albert, Avully; Pierre Courbat, Nyon, and Andre Weith, Prangins, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Nov. 21, 1978, Ser. No. 962,743
Claims priority, application Switzerland, Nov. 25, 1977, 14479/77; Mar. 17, 1978, 2937/78
Int. Cl.³ C07D *311/62*
U.S. Cl. 260—345.2 **4 Claims**

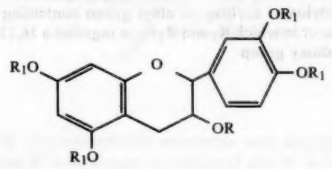
1. A process for the preparation of a (+)-cyanidan-3-ol compound of the formula



(II)

in which R_1O represents a protected hydroxy group which is readily hydrolyzed or hydrogenated and R represents hydrogen, which comprises reacting (+)-cyanidan-3-ol in an aprotic organic solvent having an elevated dielectric constant, with an alkali metal hydride and reacting the tetra-alkali metal salt of (+)-cyanidan-3-ol so obtained with a reactive ester of an alcohol of the formula HO-R_1 using a molar ratio of (+)-cyanidan-3-ol to alkali metal hydride to active ester of 1: approximately 4.25: approximately 4.5.

3. A process for the preparation of a (+)-cyanidan-3-ol compound of the formula



(II)

in which R_1O represents a protected hydroxy group which is readily hydrolyzed or hydrogenated and R represents hydrogen, which comprises reacting (+)-cyanidan-3-ol in an aprotic organic solvent having an elevated dielectric constant with an alkali metal carbonate and reacting the tetra-alkali metal salt of (+)-cyanidan-3-ol so obtained with a reactive ester of an alcohol of the formula HO-R_1 using a molar ratio of (+)-cyanidan-3-ol to alkali metal carbonate to active ester of 1: approximately 8: approximately 6.

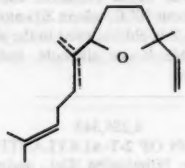
4,255,337

NOVEL ODORANTS AND FLAVORANTS

Roman Kaiser, Clifton, N.J., and Dietmar Lamparsky, Wangen, Switzerland, assignors to Givaudan Corporation, Clifton, N.J.

Filed Aug. 30, 1979, Ser. No. 71,160
Claims priority, application Switzerland, Sep. 8, 1978, 9470/78
Int. Cl.³ C07D *307/06*
U.S. Cl. 260—346.11 **6 Claims**

1. A compound of the formula;



I

wherein one of the dotted lines represents an additional bond excepting mixtures derived from, or identical to those derived from, natural sources.

4,255,338

PROCESS FOR THE PREPARATION OF 2,5-DIHYDROFURAN

William W. Prichard, Hockessin, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 13,236, Feb. 21, 1979. This application Oct. 12, 1979, Ser. No. 84,631

Int. Cl.³ C07D *307/28*

U.S. Cl. 260—346.11 **2 Claims**

1. A process for hydrogenating butadienepolyperoxide which comprises hydrogenating 1–20% by weight of butadienepolyperoxide in a solvent which is stable under the reaction conditions in the presence of hydrogen and a catalyst consisting essentially of at least 0.1% by weight of metallic silver at a temperature of from 75°–110° C. and a pressure of at least 2000 psia to form a reaction product containing 1-butene-3,4-diol and 2-butene-1,4-diol the improvement wherein the 2-butene-1,4-diol is separated from 1-butene-3,4-diol in the reaction product and contacted with hydrogen in the presence of a hydrogenation catalyst under hydrogenation condition to produce 1,4-butanediol and the 1-butene-3,4-diol is contacted with a soluble mercury salt in a hydroxylic solvent at temperatures of 20°–110° C. to produce 2,5-dihydrofuran.

4,255,339

19-HYDROXY-19-METHYL-6-ALKOXY-PGI$_1$ COMPOUNDS

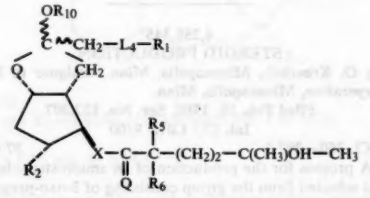
John C. Sih, Portage, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 54,720, Jul. 5, 1979, Pat. No. 4,225,507. This application Mar. 3, 1980, Ser. No. 126,507

Int. Cl.³ C07D *307/935*

U.S. Cl. 260—346.22 **5 Claims**

1. A prostacyclin-type compound of the formula



wherein

L_4 is

(1) $-(CH_2)_n-$, wherein n is one to 5, inclusive, or

(2) $-(CH_2)_p-CF_2-$, wherein p is 2, 3, or 4,

wherein R_{10} is straight-chain alkyl of one to 6 carbon atoms, inclusive;

wherein

Q is oxo, α—H:β—H, α—OH:β—R_4, or α—R_4:ε—OH,

wherein

R_4 is hydrogen or alkyl of one to 4 carbon atoms, inclusive,

wherein

R_1 is

(1) $-COOR_3$,

(2) $-CH_2OH$,

(3) $-CH_2N(R_7)(R_8)$,

(4) $-CO-N(R_7)(R_8)$,

(5) $-CO-NH-SO_2-R_{15}$, or

(6) tetrazolyl,

wherein R_3 is

(a) hydrogen,

(b) alkyl of one to 12 carbon atoms, inclusive,

(c) cycloalkyl of 3 to 10 carbon atoms, inclusive,

(d) aralkyl of 7 to 12 carbon atoms, inclusive,

(e) phenyl,

(f) phenyl substituted with one, 2, or 3 chloro or alkyl groups of one to 3 carbon atoms, inclusive;

(g) —(p-Ph)—CO—CH_3,

(h) —(p-Ph)—NH—CO—(p-Ph)—NH—CO—CH_3,

(i) —(p-Ph)—NH—CO—(Ph),

(j) —(p-Ph)—NH—CO—CH_3,

(k) —(p-Ph)—NH—CO—NH_2,

(l) —(p-Ph)—CH=N—NH—CO—NH_2,

(m) β-naphthyl,

(n) $-CH_2-CO-R_{16}$,

wherein

—(p-Ph)— is para-phenylene and —(Ph) is phenyl;

wherein

R_{16} is phenyl, p-bromophenyl, p-biphenylyl, p-nitrophenyl, p-benzamidophenyl, or 2-naphthyl, or

(o) a pharmacologically acceptable cation; wherein R_7 and R_8 are hydrogen, alkyl of one to 12 carbon atoms, inclusive, benzyl, or phenyl, being the same or different, and wherein R_{15} is hydrogen, alkyl of one to 12 carbon atoms, inclusive, phenyl, phenyl-substituted with one, 2, or 3 chloro or alkyl groups of one to 3 carbon atoms, inclusive, or phenyl substituted with hydroxycarbonyl or alkoxycarbonyl of one to 4 carbon atoms, inclusive,

wherein

R_2 is hydrogen, hydroxyl, or hydroxymethyl,

wherein

R_5 and R_6 are hydrogen, alkyl of one to 4 carbon atoms, inclusive, or fluoro, being the same or different, with the proviso that one of R_5 and R_6 is fluoro only when the other is hydrogen or fluoro, and

wherein

X is

(1) trans—CH=CH—,

(2) cis—CH=CH—,

(3) —C≡C—, or

(4) $-CH_2CH_2-$.

4,255,340

METHOD FOR PREPARING AN ALKENYL-SUBSTITUTED DICARBOXYLIC ACID ANHYDRIDE

Justin C. Powell, Wappingers Falls, N.Y., assignor to Texaco Inc., White Plains, N.Y.

Filed Aug. 27, 1979, Ser. No. 70,187

Int. Cl.³ C07D *307/60*

U.S. Cl. 260—346.74 **13 Claims**

1. A method for preparing an alkenyl-substituted acid anhydride which comprises reacting an olefin or a polyolefin polymer having a number average molecular weight ranging from about 40 to 3000 with an unsaturated dicarboxylic acid anhydride at a temperture in the range from about 175° to 300° C. employing a mole ratio of from about 0.8 to 5 moles of said anhydride per mole of said olefin or polyolefin in the presence of a brominated hydroxy compound represented by the formula:

$$(HO)_c-(R''')_d-X$$

in which X is a bromine atom, R''' represents a divalent hydro-

carbyl or substituted hydrocarbyl radical having from 2 to 18 carbon atoms said hydrocarbyl radical consisting of the group of alkyl, alkenyl, alkynyl, aryl, alkaryl, alkenaryl, and alkynaryl and said substituents being hydroxy and halogen and c and d are numbers from 1 to 6 with the proviso that brominated phenolic type compounds are excluded, said brominated hydroxy compound being present in an amount to provide from about 5 to 5000 ppm of bromine based on said olefin or polyolefin.

4,255,341
CATALYST AND PROCESS FOR PRODUCING ETHYLENE OXIDE

Paul W. Solomon, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Mar. 22, 1979, Ser. No. 22,919
Int. Cl.³ C07D 301/10; B01J 21/04, 23/02, 23/50
U.S. Cl. 260—348.34 **17 Claims**

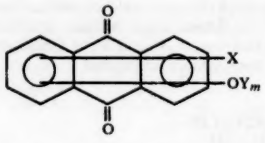
1. A process for preparing a catalyst for the oxidation of ethylene to ethylene oxide consisting essentially of combining aqueous silver nitrate with a suitable solid support in an amount which will result in said catalyst containing about 2 to about 75 weight percent silver based on the weight of said solid support, then drying the thus treated support at a temperature in the range of about 100° C. to about 200° C. to remove substantially all the water associated with said support, and then calcining the dried support at a temperature in the range of about 250° C. to about 800° C. to obtain an active catalyst.

4,255,342
SYNTHESIS OF PHENOXYANTHRAQUINONES

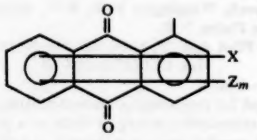
Arthur D. Olin, Lakewood, N.J., assignor to Toms River Chemical Corporation, Toms River, N.J.

Filed Apr. 2, 1979, Ser. No. 25,523
Int. Cl.³ C07C 50/34
U.S. Cl. 260—383 **13 Claims**

1. In the manufacture of a phenoxyanthraquinone of the structure



where X is chloro, methyl or hydrogen,
Y is phenyl lower-alkoxyphenyl, or lower alkylphenyl at the 1-, 4-, 5- or 8- position, and
m is 1 or 2,
comprising the step of treating an anthraquinone of the structure



where X is chloro, methyl or hydrogen, selected as above,
Z is chloro or nitro at the position selected for -OY above, provided that Z is nitro when X is chloro,
and m is 1 or 2, selected as above, with at least about m equivalents of a phenoxide of structure

YOM

where Y is phenyl lower-alkoxyphenyl, or lower-alkylphenyl, selected as above, in a liquid solvent, and M is an alkali metal, the improvement wherein the liquid solvent is a liquid aromatic hydrocarbon or liquid aromatic chlorohydrocarbon, boiling at or above about 90° C. where Z is nitro, or at or above about 120° C. where Z is chloro, used in the absence of excess phenol, water-miscible lower alkanols, and water-miscible polar aprotic solvents.

4,255,343
PREPARATION OF 2-T-ALKYLANTHRACENE

Lawrence W. Gosser, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Aug. 13, 1979, Ser. No. 65,862
Int. Cl.³ C07C 45/28, 50/18, 2/64, 2/66
U.S. Cl. 260—385 **14 Claims**

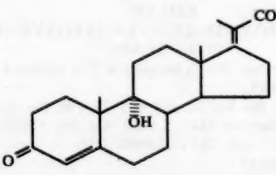
1. Process for preparing 2-t-alkylanthracene, which process comprises intimately contacting and reacting, at a temperature of at least 110° C., anthracene and a branched-chain alkylating agent, the alkylating moiety of which contains at least four carbon atoms, in the presence of a catalyst selected from hydrocarbonsulfonic acids which are free of non-aromatic unsaturation, organic carboxylic acids having a K_a of 0.6 to 0.001, acid zeolites, amorphous silica-aluminas, and polymeric arenesulfonic acid resins, to give a product mixture of which the major constituent is 2-t-alkylanthracene.

4,255,344
9-α-HYDROXY STEROIDS

Yukio Imada, Yokohama, and Sumiko Mizuno, Tokyo, both of Japan, assignors to Mitsubishi Chemical Industries, Limited, Tokyo, Japan

Filed Oct. 17, 1979, Ser. No. 85,639
Claims priority, application Japan, Nov. 8, 1978, 53-137443; Jul. 2, 1979, 54-83628
Int. Cl.³ C07J 9/00
U.S. Cl. 260—397.1 **1 Claim**

1. A compound, 9α-hydroxy-3-oxopregna-4,17(20)-diene-20-carboxylic acid or its methyl ester which is represented by the formula (I):



(I)

wherein R is hydrogen or methyl.

4,255,345
STEROID PRODUCTION

Leroy O. Krbechek, Minneapolis, Minn., assignor to Henkel Corporation, Minneapolis, Minn.

Filed Feb. 19, 1980, Ser. No. 122,397
Int. Cl.³ C07J 9/00
U.S. Cl. 260—397.1 **37 Claims**

1. A process for the production of an amido-steroidal compound selected from the group consisting of 3-oxo-pregna-1,4-diene-20-carboxylic acid amide; 3-oxo-pregn-4-ene-20-carboxylic acid amide; 3-oxo-pregna-1,4,17(20)-triene-20-carboxylic acid amide; and 3-oxo-pregna-4,17(20)-diene-20-carboxylic acid amide and mixtures thereof comprising:
(a) reacting a member selected from the group consisting of the parent acid of the amido-steroidal compound and mixtures thereof with a sufficient amount of an inorganic halogenating agent to obtain the corresponding carbonyl halide; and,
(b) reacting the carbonyl halide formed in (a) in the presence of a source of ammonia in a sufficient amount, to form the

3-oxo-pregna-1,4-diene-20-carboxylic acid amide; 3-oxo-pregn-4-ene-20-carboxylic acid amide; 3-oxo-pregna-1,4,17(20)-triene-20-carboxylic acid amide; and 3-oxo-pregna-4,17(20)-diene-20-carboxylic acid amide and mixtures thereof thereby obtaining the desired amido-steroid.

4,255,346

PRODUCTION OF AN EDIBLE OIL FROM CRUDE SOY OIL

Manfred Kock, Emmerich, Fed. Rep. of Germany, assignor to Akzo N.V., Arnhem, Netherlands

Filed May 10, 1978, Ser. No. 904,397
Int. Cl.[3] C09F 5/02; C11B 1/10
U.S. Cl. 260—412.4 **10 Claims**

1. A method for producing an edible soybean oil which comprises moistening soybean pieces in the form of crushed and rolled flakes to raise their water content to 12 to 25% by weight and subjecting the moistened flakes to a heat treatment at temperatures in the range of 90° to 120° C. accompanied by a compacting mechanical movement of said flakes sufficient to reach a minimum bulk weight thereof of at least about 400 kg/m^3, subsequently extracting crude soybean oil from said flakes with a non-polar solvent, removing licithin from the crude soybean oil, bleaching the resultant delecithinized oil, and, directly after the bleaching and without a separate deslimming step, simultaneously deodorizing and deacidizing the delecithinized crude soybean oil to obtain edible soybean oil free from bitter taste.

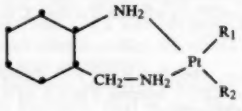
4,255,347

PLATINUM COMPLEX

Yoshinori Kidani, 2-718, Mataho Kodan-jutaku, 2-1, Matahocho, Nishi-ku, Nagoya-shi; Koji Okamoto, Toyota, and Reiko Saito, Toyoake, all of Japan, assignors to Yoshinori Kidani, Nagoya, Japan

Filed Aug. 31, 1979, Ser. No. 71,629
Claims priority, application Japan, Sep. 2, 1978, 53/107776
Int. Cl.[3] C07F 15/00
U.S. Cl. 260—429 R **1 Claim**

1. A platinum complex represented by the general formula:



wherein

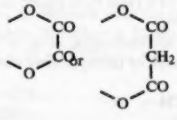
R_1 and R_2 are same and represent BR, I or NO_3,

or

R_1 is SO_4 and R_2 is H_2O,

or

R_1 and R_2 are bonded with each other to form either



and the configuration of 1-aminomethyl-2-aminocyclohexane is selected from trans-l, trans-d, cis-l and cis-d.

4,255,348

PREPARATION OF DIMETHYLAMINOSILANES

William B. Herdle, Greenburgh, and Bernard Kanner, West Nyack, both of N.Y., assignors to Union Carbide Corporation, New York, N.Y.

Filed Oct. 24, 1979, Ser. No. 87,797
Int. Cl.[3] C07F 7/08
U.S. Cl. 556—410 **10 Claims**

1. A process for preparing dimethylaminosilane having the formula

$$H_{4-a}Si[N(CH_3)_2]_a$$

wherein a has a value of 2 to 4 inclusive, said process comprising reacting (1) copper activated silicon particles and (2) dimethylamine gas in a gas-solid reactor at a temperature in the range of about 195° C. to about 400° C.

4,255,349

CONVERSION OF SYNTHESIS GAS WITH IRON-CONTAINING CATALYST

Stephen A. Butter, and Arthur W. Chester, both of Cherry Hill, N.J., assignors to Mobil Oil Corporation, Fairfax, Va.

Filed Dec. 18, 1978, Ser. No. 970,307
Int. Cl.[3] C07C 1/04
U.S. Cl. 260—449.6 R **8 Claims**

1. A process for converting synthesis gas comprising carbon monoxide and hydrogen to a hydrocarbon product comprising at least 45 weight percent of C_5+ naptha while limiting the production of methane plus ethane to no more than 30 weight percent which comprises contacting said synthesis gas at a temperature of from about 500° to 600° F. and at a pressure of from 50–1000 psig with a catalyst containing from about 2.5 to 20 weight percent Fe prepared by forming a homogenous mixture of a water insoluble, decomposable iron derivative of an organic compound, a matrix, and an acidic crystalline aluminosilicate zeolite having a silica-to-alumina ratio of at least 12, a pore size greater than about 5 Angstrom units and a constraint index of about 1 to 12, drying and heating said mixture to decompose the organic iron compounds, and treating it with carbon monoxide or mixtures containing the same at elevated temperatures.

4,255,350

PROCESS FOR PREPARING METHYL ISOCYANATE

Vagab S. Aliev, ulitsa Nizami, 66, kv. 10; Sakhib M. O. Aliev, ulitsa Barinova, 12, kv. 31; Farrukh R. O. Gadzhiev, ulitsa Druzhba-Molodezhi, 47, kv. 48; Novruz I. O. Guseinov, poselok novy Akhmedly, proezd 1730, 13V, kv. 96; Shamkhal A. M. O. Mamedov, ulitsa Malygina, 1, kv. 31; Medzhid A. Mardanov, ulitsa 28, Aprelya, 72, kv. 27; Rafail S. Sverdlov, Rabochy proezd, 5, kv. 39, and Dzhavid N. O. Khydyrov, Leningradsky prospekt, 138, kv. 10, all of Baku, U.S.S.R.

Filed Sep. 4, 1979, Ser. No. 72,418
Int. Cl.[3] C07C 118/00
U.S. Cl. 260—453 P **6 Claims**

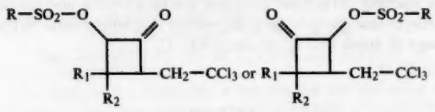
1. A process for preparing methyl isocyanate comprising the steps of providing in a reaction zone a reaction mixture consisting essentially of an organic solvent, an alkali metal cyanate or an alkaline earth metal cyanate and a catalyst selected from the group consisting of alkali metal bromides, alkaline earth metal bromides, alkali metal iodides and alkaline earth metal iodides; contacting the reaction mixture with a methyl halide selected from the group consisting of methyl chloride, methyl bromide and methyl iodide at a rate of from about 0.5 to 3 moles of methyl halide per mole of cyanate per hour for from about 1 to 4 minutes, the ratio of organic solvent to methyl halide being from about 3:1 to 5:1; and simultaneously withdrawing the methyl isocyanate from the reaction zone.

4,255,351
SULFONIC ACID ESTERS OF 2,2,2-TRICHLOROETHYLHYDROXYCYCLOBUTANONES

Pierre Martin, Rheinfelden, Switzerland; Hans Greuter, Cos Cob, Conn., and Daniel Bellus, Riehen, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Mar. 5, 1979, Ser. No. 17,872
Claims priority, application Switzerland, Mar. 14, 1978, 27587/78
Int. Cl.[3] C07C *143/68*
U.S. Cl. 260—456 R 2 Claims

1. A compound of the formula



wherein

R represents alkyl or haloalkyl of 1 to 4 carbon atoms, benzyl, phenyl, methylphenyl, nitrophenyl, chlorophenyl or bromophenyl, and

one of R_1 and R_2 represents methyl and the other represents hydrogen or methyl or R_1 and R_2 together represent alkylene of 2 or 3 carbon atoms.

4,255,352
PREPARATION OF UNSATURATED NITRILES

Charles A. Drake, and Stanley J. Marwil, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Apr. 24, 1979, Ser. No. 32,974
Int. Cl.[2] C07C *120/00, 121/46, 121/20, 121/66*
U.S. Cl. 260—465.8 R 24 Claims

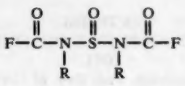
1. A process which comprises contacting at least one olefinic hydrocarbon reactant, at least one olefinically unsaturated mononitrile reactant and at least one monoadduct reaction product of an olefinic hydrocarbon compound and an olefinically unsaturated mononitrile compound, in a plurality of tank reactors in series in the presence of a diluent, under reaction conditions suitable to produce at least one olefinically unsaturated dinitrile product, each of said olefinically unsaturated mononitrile reactant and said olefinically unsaturated mononitrile compound containing at least one hydrogen atom attached to a doubly bonded carbon atom and containing a cyano group attached to a carbon atom adjacent and doubly bonded to a carbon atom which is attached to at least one hydrogen atom, each of said olefinic hydrocarbon reactant and said olefinic hydrocarbon compound having at least one olefinic linkage having joined to one of the doubly bonded carbons a carbon atom having at least one hydorgen atom attached thereto, wherein at substantially any point in said plurality of tank reactors in series the concentration of said monoadduct reaction product in the resulting reaction mixture is within the range of about 10 to about 90 weight percent of the total reaction mixture, wherein the amount of said diluent is in the range of about 0.01 to about 1.25 parts by weight of total diluent per part by weight of said olefinically unsaturated mononitrile reactant if at least one of said plurality of tank reactors in series is operated downflow, and wherein the amount of said diluent is in the range of about 0.01 to about 40 parts by weight of total diluent per part by weight of said olefinically unsaturated mononitrile reactant if all of said plurality of tank reactors in series are operated upflow.

4,255,353
SULFINYL-BIS CARBAMOYL FLUORIDES

Anthony D. Wolf, Newark, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Oct. 22, 1979, Ser. No. 87,078
Int. Cl.[3] C07C *125/03*
U.S. Cl. 260—544 C 2 Claims

1. A compound of the formula



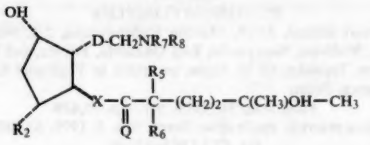
where R is C_1–C_3 alkyl.

4,255,354
2-DECARBOXY-2-AMINOMETHYL-19-HYDROXY-19-METHYL-6-OXO-PGF$_1$ COMPOUNDS

John C. Sih, Portage, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 54,720, Jul. 5, 1979, Pat. No. 4,225,507. This application Mar. 3, 1980, Ser. No. 126,495
Int. Cl.[3] C07C *87/34, 87/40, 87/451, 87/453*
U.S. Cl. 564—305 1 Claim

1. A prostacyclin-type compound of the formula



wherein D is $-(CH_2)_2-CO\,CH_2-L_2-$ or $-CH_2-CO-CH_2-L_3-$

wherein L_2 is

(1) $-(CH_2)_j$, wherein j is one to 4, inclusive,

(2) $-(CH_2)_q-CF_2-$, wherein q is one, 2, or 3, or

(3) $-CH=CH-$,

wherein L_3 is

(1) $-(CH_2)_n-$, wherein n is one to 5, inclusive,

(2) $-(CH_2)_p-CF_2-$, wherein p is 2, 3, or 4, or

(3) $-CH_2-CH=CH-$;

wherein Q is oxo, α—H:β—H, α—OH:β—R_4, or α—R_4:β—OH,

wherein R_4 is hydrogen or alkyl of one to 4 carbon atoms, inclusive,

wherein R_2 is hydrogen, hydroxyl, or hydroxymethyl;

wherein R_5 and R_6 are hydrogen, alkyl of one to 4 carbon atoms, inclusive, or fluoro, being the same or different, with the proviso that one of R_5 and R_6 is fluoro only when the other is hydrogen or fluoro;

wherein R_7 and R_8 are hydrogen, alkyl of one to 12 carbon atoms, inclusive, benzyl, or phenyl, being the same or different;

wherein X is

(1) trans—CH=CH—,

(2) cis—CH=CH—,

(3) —C≡C—, or

(4) $-CH_2CH_2-$.

4,255,355

2-DECARBOXY-2-AMINOMETHYL-6-KETO-PGE$_1$ COMPOUNDS

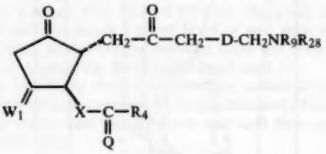
Udo F. Axen, Plainwell, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 829,679, Sep. 2, 1977, Pat. No. 4,205,178, which is a continuation-in-part of Ser. No. 755,675, Dec. 30, 1976, abandoned. This application Aug. 27, 1979, Ser. No. 70,224

Int. Cl.^{3} C07C *177/00*

U.S. Cl. 564—305 **37 Claims**

1. A compound of the formula



wherein W_1 is a α-OH:β-H, α-H:β-OH, α-H:β-H, methylene, or α-CH_2OH:β-H;

wherein Q is oxo, α-H:β-H, α-R_8:β-OH, or α-OH:β-R_8

wherein R_8 is hydrogen or alkyl of one to 4 carbon atoms, inclusive;

wherein R_4 is

(1) $—C(R_5)(R_6)—C_gH_{2g}—CH_3$

(2) $—C(R_5)(R_6)—Z—(Ph)$ or

(3) cis—CH_2—CH=CH—CH_2CH_3,

wherein C_gH_2 g is alkylene of one to 9 carbon atoms, inclusive, with one to 5 carbon atoms, inclusive, in the chain between $—CR_5R_6—$ and terminal methyl, wherein R_5 and R_6 are hydrogen, alkyl of one to 4 carbon atoms, inclusive, or fluoro, being the same or different, with the proviso that one of R_5 and R_6 is fluoro only when the other is hydrogen or fluoro and the further proviso that neither R_5 nor R_6 is fluoro when Z is oxa (—O—); wherein Z represents an oxa atom (—O—) or C_jH_{2j} wherein C_jH_{2j} is a valence bond or alkylene of one to 9 carbon atoms, inclusive, with one to 6 carbon atoms, inclusive between CR_5R_6— and the (Ph); wherein (Ph) is phenyl or phenyl substituted by (T)s,

wherein T is alkyl of one to 4 carbon atoms, inclusive, fluoro, chloro, trifluoromethyl, or $—OR_7—$ wherein R_7 is alkyl of one to 4 carbon atoms, inclusive, and

wherein s is zero, one, 2 or 3, with the proviso that not more than two T's are other than alkyl and when s is 2 or 3 the T's are either the same or different;

wherein R_9 is hydrogen, methyl or ethyl; and

wherein R_{28} is hydrogen, alkyl of one to 4 carbon atoms, inclusive, aralkyl of 7 to 12 carbon atoms, inclusive, phenyl or phenyl substituted with alkyl of one to 4 carbon atoms, inclusive;

wherein D is

(1) $—(CH_2)_d—C(R_2)_2—$

(2) $—CH_2—O—CH_2—Y—$ or

(3) $—CH_2—CH=CH—$

wherein d is zero to 5, R_2 is hydrogen, methyl, or fluoro, being the same or different with the proviso that one R_2 is not methyl when the other is fluoro, and Y is a valence bond, $—CH_2—$ or $—(CH_2)_2—$, and

wherein X is

(1) trans—CH=CH—

(2) cis—CH=CH—

(3) —C≡C—

(4) $—CH_2CH_2—$.

4,255,356

PURIFICATION OF TERTIARY AMINES USING AN ADSORBENT

Alfred Coenen; Kurt Kosswig, both of Marl; Ferdinand Von Praun, Haltern, and Hans-Peter Schüller, Marl, all of Fed. Rep. of Germany, assignors to Chemische Werke Hüls AG, Marl, Fed. Rep. of Germany

Filed Aug. 8, 1979, Ser. No. 64,808

Int. Cl.^{3} C07C *85/26*

U.S. Cl. 564—499 **12 Claims**

1. A method of purifying impure tertiary amines by separating them from primary and secondary amines and/or their hydrochloride impurities resulting from the preparation of said tertiary amines, comprising, passing said tertiary amines over an adsorbent selected from the group consisting of

(a) aluminum oxide having a specific surface area of about 100 to 400 m^2/g;

(b) silica gel having a specific surface area of about 500 to 700 m^2/g;

(c) silanized silica gel having a specific surface area of about 300 to 400 m^2/g; where specific surface area is measured according to the BET method and thereby moving said primary and secondary amines and/or their hydrochloride impurities and separating pure tertiary amines.

4,255,357

CATALYTIC PROCESS FOR PREPARING ETHYL AMINES

David A. Gardner, Montgomery, and Roger T. Clark, Chester, both of Pa., assignors to Pennwalt Corporation, Philadelphia, Pa.

Filed Mar. 24, 1980, Ser. No. 132,838

Int. Cl.^{3} C07C *85/06*

U.S. Cl. 564—480 **3 Claims**

1. A process for the preparation of ethyl amines by reacting ethyl alcohol, ammonia, and hydrogen over a supported catalyst consisting essentially of reduced cobalt in the vapor phase at temperatures in the range of 140° C. to 195° C.

4,255,358

PROCESS FOR THE PRODUCTION OF HEXANITROSTILBENE

Ronald H. Jones, London, and Alexander W. H. Pryde, Waltham Abbey, both of England, assignors to The Secretary of State for Defence in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England

Filed Mar. 6, 1979, Ser. No. 17,973

Claims priority, application United Kingdom, Mar. 13, 1978, 9909/78

Int. Cl.^{3} C07C *76/02, 79/10*

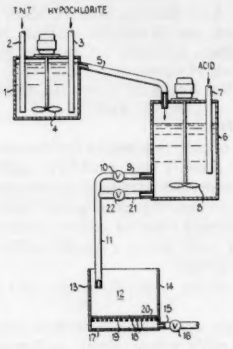
U.S. Cl. 568—931 **12 Claims**

1. In a process for preparing 2, 2', 4, 4', 6, 6' hexanitrostilbene wherein an alkali or alkaline earth metal hypochlorite and 2, 4, 6-trinitrotoluene are reacted in an aqueous organic solvent, and 2, 2', 4, 4', 6, 6' hexanitrostilbene is precipitated, the improvement which comprises

(a) allowing the reaction mixture to stand for at least 30 minutes after the said reactants are mixed together,

(b) mixing with the reaction mixture a mineral acid with stirring to adjust the pH to less than 5 and agglomerating the hexanitrostilbene precipitate,

(c) allowing the product of (b) to separate into upper and lower layers, and



(d) filtering the lower of said layers to remove the suspended product.

4,255,359

NON-POLLUTING OXYHYDROCHLORINATION PROCESS

Jean-Pierre Brunelle, Fresnes, France, assignor to Rhone-Poulenc Industries, Paris, France

Filed Apr. 9, 1979, Ser. No. 28,380
Claims priority, application France, Apr. 26, 1978, 78 12256
Int. Cl.[3] C07C *21/00*
U.S. Cl. 570—243 **12 Claims**

1. In a process of non-polluting oxyhydrochlorination in which gaseous hydrogen chloride, air, or oxygen, ethylene and/or a chlorinated derivative of ethylene are reacted to obtain an effluent containing chlorinated derivatives of ethylene, whereby there are removed from said effluent the unwanted chlorinated derivatives of ethylene produced during said oxyhydrochlorination reaction, the residual effluent containing essentially oxygen, nitrogen, carbon monoxide, carbon dioxide, unreacted ethylene, 1,2-dichloroethane and at least one chlorinated hydrocarbon from the group consisting of chloroform, carbon tetrachloride, ethyl chloride, 1,1-dichloroethane, 1,1,1- and 1,1,2-trichloroethanes, 1,1,2,2- and 1,1,1,2-tetrachloroethanes, vinyl chloride, 1,1- and 1,2-dichloroethylenes, trichloroethylene, perchloroethylene and chloral, wherein said residual effluent is preheated to a temperature between about 250° and 400° C.; the improvement comprising subjecting said heated residual effluent to oxidation by the action of an oxidation catalyst comprising the combination of a metal selected from the class consisting of platinum and iridium and mixtures thereof, deposited on a support of alumina of eta crystallographic structure, thereby producing a mixture of gases comprising carbon dioxide, hydrochloric acid, water vapor, oxygen, and nitrogen.

4,255,360

WATER AERATOR AND METHOD

Kerry P. Jeffries, 5611 Knobby Knoll, Houston, Tex. 77092

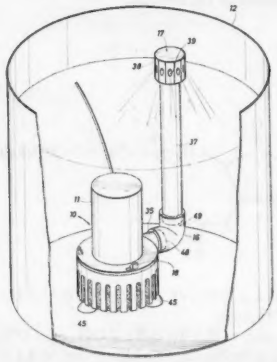
Filed Aug. 27, 1979, Ser. No. 69,856
Int. Cl.[3] B01F *3/04*
U.S. Cl. 261—5 **38 Claims**

1. A live bait water aerator comprising:

(A) a submergible electrically powered water pump;

(B) a delivery conduit having a delivery entrance hole on one end and a delivery exit hole on the other end with a fluid passage connecting the entrance hole and the exit hole, the delivery conduit attached to the water outlet of the pump so that water can pass from the pump through the delivery entrance hole of the conduit, said conduit extending to a height above the bottom of the pump of between about 20 and about 40 centimeters;

(C) a water delivery head with a height of between about 5 and about 1.5 centimeters and a cross-section maximum width less than about 5 centimeters and a cross-section minimum width greater than 2 centimeters, the head having an entrance hole in the bottom sealingly attached to the delivery exit hole of the conduit so that water can pass through the conduit into the head, the vertical sides having a plurality of openings evenly spaced over the sides of the head having a diameter of between about 0.25 and about 0.40 centimeters, and a length of between about 0.35 and about 0.55 centimeters, the entrance to the opening being higher than the exit of the opening so that a line through the center of the length of the opening forms an acute angle with a vertical line through the cross sectional center of the opening of between about 30 and about 55 degrees.

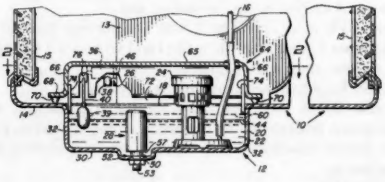


4,255,361

AUTOMATIC FLUSHING AND DRAINING RESERVOIR APPARATUS FOR EVAPORATIVE COOLERS

Adam D. Goettl, 4960 E. Palomino Rd., Phoenix, Ariz. 85018

Continuation-in-part of Ser. No. 007,027, Jan. 29, 1979, Pat. No. 4,192,832. This application Jan. 24, 1980, Ser. No. 115,041
Int. Cl.[3] B01F *3/04*
U.S. Cl. 261—27 **11 Claims**



1. An automatic flushing and draining reservoir for an evaporative cooler comprising:

(a) an evaporative cooler including a water distribution plumbing system for carrying water to the upper portion of said cooler and a floor pan for receiving unevaporated water draining by gravity from the upper portion of said cooler;

(b) a tank integrally and dependingly formed in the floor pan of said cooler and opening upwardly to receive the unevaporated water from said floor pan, said tank having a cross sectional area which is less than the cross sectional area of the floor pan of said evaporative cooler with the

opening of said tank being substantially equal to the cross sectional area of said tank;

(c) a float controlled shutoff valve means for supplying water from an external source of said tank and maintaining it at a predetermined operating level;

(d) pump means for pumping water from said tank into the water distribution plumbing system of said cooler and allowing the pumped water in the distribution plumbing system to drain back into said tank upon interruption of the operation of said pump means so that this returning pumped water in conjunction with the unevaporated water received from the floor pan of said cooler will cause the water level in said tank to rise from the operating level to a flooded level;

(e) a siphon drain valve mounted in said tank with its water inlet adjacent the bottom thereof and having an elevated water passage zone located between the water operating level and the flooded water level of said tank so that its siphoning action will be initiated upon the water level in said tank reaching the flooded level; and

(f) said tank being sized with its water surface area as small as possible as determined by its containment of said siphon drain valve, said pump means and said float controlled shut-off valve.

4,255,362

ACCELERATOR PUMP CONTROL APPARATUS

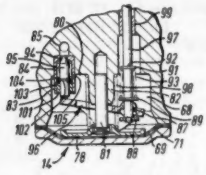
Gray E. D. Ross, Stanmore, England, assignor to The Zenith Carburetter Company Limited, Stanmore, England

Filed Mar. 5, 1979, Ser. No. 17,592

Claims priority, application United Kingdom, Mar. 9, 1978, 9467/78

Int. Cl.³ F02M *7/08*

U.S. Cl. 261—34 B **28 Claims**



1. A fuel pump for incorporation in an i.c. engine air/fuel induction system which includes a carburetter having a driver operable throttle valve as well, the fuel pump comprising a hollow casing, a movable wall which divides the interior of the hollow casing into an air chamber and a fuel chamber which is for connection to a source of liquid fuel and the air/fuel induction system, resilient means which urge the movable wall to minimise the volume of the fuel chamber and thermostatically controlled means which are adapted to be responsive to the temperature of the engine to which the fuel pump is fitted when used, wherein the improvement comprises the provision of pressure regulating means for regulating a depression in said air chamber in accordance with a function of the depression that is established in the inlet manifold of the engine to which the pump is fitted when used and to the temperature of that engine, the pressure regulating means including a valve which is operatively associated with said thermostatically controlled means and which is adapted to be urged to restrict communication between the air chamber and the inlet manifold of the engine in response to a tendency for the depression in said air chamber to exceed a predetermined maximum when said predetermined maximum depression acts within the air chamber and the depression in the inlet manifold of the engine is at or above said predetermined maximum whilst, at least when the temperature of the engine is less than the normal working temperature, permitting relatively free communication between the air chamber and the inlet manifold of the engine when the depression in the inlet manifold of the engine is less than said predetermined maximum, the thermostatically controlled means co-operating with the valve and with an air bleed into the air chamber such that the volume of the air chamber, when communication between the air chamber and the inlet manifold is restricted, increases as the temperature of the engine increases.

4,255,363

COLUMN SEAL

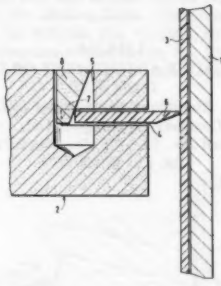
Wilhelm Geiger, Bäumenheim, and Adolf Swozil, Kühlenthal, both of Fed. Rep. of Germany, assignors to Sigri Elektrographit Gesellschaft mit beschränkter Haftung, Meitingen bei Augsburg, Fed. Rep. of Germany

Filed Dec. 21, 1979, Ser. No. 106,168

Claims priority, application Fed. Rep. of Germany, Jan. 9, 1979, 2900573

Int. Cl.³ B01F *3/04*

U.S. Cl. 261—114 TC **4 Claims**



1. A column with a cylindrical wall, at least one circular tray disposed in the interior of the column at about a right angle to the wall of the column with the periphery of the tray spaced from the wall of the column, circular recesses in the form of a circular slot at the periphery of the tray, profiled seals engaged in the recesses and extending out of the recesses with the profiled ends of the seals in contact with the wall of the column, blind holes in the tray extending down from a circumferential surface at a distance from the periphery to intersect the circular slot, and locking means in the blind holes engaging the seals to press with adjustable pressure the profiled ends against the wall of the column.

4,255,364

LARGE MIRROR REPLICATION PROCESS

John W. Talbert, 442 Alcatraz Ave., Oakland, Calif. 94609

Filed Dec. 12, 1977, Ser. No. 860,015

Int. Cl.³ B29D *11/00*

U.S. Cl. 264—1.9 **16 Claims**

5. A process of replicating a large scale optical surface comprising the steps of:

preparing first and second substantially similar optical masters, each of said masters formed by the process of machining and grinding a rigid steel supporting surface, vacuum drawing and annealing a relatively flexible acrylic liner to said steel surface, and optically polishing said acrylic liner;

pouring on said first optical master an epoxy layer to form thereon said replicated optical surface;

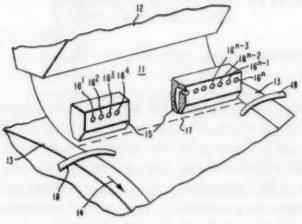
laying and fabricating on said second optical master a rigid substrate for the support of said replicated optical surface;
flexing the acrylic liner of said second optical master to release said supporting substrate;
placing said supporting substrate over said replicated optical surface on said first optical master at a preselected distance from the back of said replicated optical surface to form an interstice between the back surface of said replicated optical surface and the front surface of said supporting substrate;
introducing into said interstice a rubber for bonding said replicated optical surface to said substrate so as to form a single assembly;
continuously maintaining a vacuum between the acrylic liner and steel supporting surface of said first optical master during said pouring, placing, and introducing steps;
releasing said vacuum to allow removal of the acrylic liner from the steel supporting surface of said first optical master; and
separating said single assembly from said first optical master by flexing the acrylic liner of said first optical master.

4,255,365

PNEUMATIC GAUGE ADJUSTMENT OF EDGE-PINNED CAST WEB

David E. Heyer, Kingston, Ohio, assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jan. 23, 1979, Ser. No. 5,718
Int. Cl.³ B29D *7/02*
U.S. Cl. 264—22 **8 Claims**



1. In a process for quenching and adjusting the gauge of molten thermoplastic web which includes extruding the web onto a quenching surface and pinning each lateral edge of the web to the quenching surface,
the improvement which comprises,
directing air through a plurality of air jets and against the web before the pinning and along the line of initial contact between the web and the quenching surface, and
adjusting the air being directed against the web to provide air in the vicinity of each pinned edge such that air forces against the web are greatest where the web will be pinned and are decreased inwardly from that site.

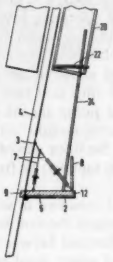
4,255,366

PROCESS OF PRODUCING A COOLING TOWER

Wolfgang Zerna, Hattingen; Wilfried Krabbe, Buchschlag, and Hans Schäfer, Darmstadt, all of Fed. Rep. of Germany, assignors to Philipp Holzmann AG, Frankfurt am Main, Fed. Rep. of Germany

Filed Dec. 28, 1978, Ser. No. 974,047
Claims priority, application Fed. Rep. of Germany, Dec. 30, 1977, 2759087
Int. Cl.³ E04B *1/54*
U.S. Cl. 264—35 **7 Claims**

1. In a process for the production of a cooling tower formed from a shell of a desired form and a suitable material such as reinforced concrete, the steps comprising suspending a plurality of plate-like reinforcing elements adjacent to a surface of said shell in at least one horizontal plane by suspension elements connected to suspension locations on said shell above said plane, said elements in a plane substantially abutting one another, and connecting said reinforcing elements to said shell at spaced points on said shell.

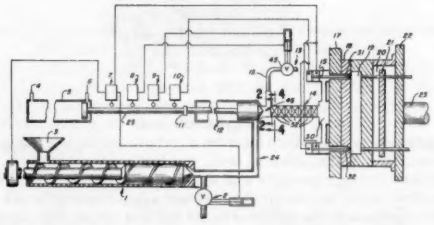


4,255,367

METHOD FOR INJECTION MOLDING ARTICLES WHEREIN ADDITIVES ARE ADDED IN SELECTIVE PORTIONS

Clarence W. Wallace, Pittsfield, Mass., and Howard A. Koenig, Medina, Ohio, assignors to Standard Oil Company (Indiana), Chicago, Ill.

Division of Ser. No. 692,339, Jun. 3, 1976, Pat. No. 4,135,870.
This application Sep. 21, 1978, Ser. No. 944,359
Int. Cl.³ B29D *27/00*
U.S. Cl. 264—45.1 **5 Claims**



1. The method for producing injection molded plastic articles from a thermoplastic resin containing an additive comprising:
(1) melting a thermoplastic resin;
(2) transferring said thermoplastic resin to an accumulation zone where it is maintained in a molten state;
(3) when sufficient molten resin is in said accumulation zone to fill a mold, ejecting said molten resin from said accumulation zone to form a resin stream which is channeled past a point for introducing an additive, through a mixing zone and into said mold;
(4) introducing an additive into a preselected portion of said resin stream to form a product of step (4); and,
(5) channeling the product of step (4) through said mixing zone and into said mold.

3. The method of claim 1 wherein said preselected portion of said resin stream is that portion of said resin stream which forms the core of the molded article.

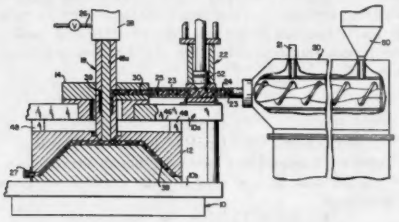
5. The method of claim 3 wherein said additive is a blowing agent.

4,255,368

STRUCTURAL FOAM MOLDING PROCESS

Olagoke Olabisi, Plainfield, N.J., assignor to Union Carbide Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 841,822, Oct. 13, 1977, abandoned. This application Jul. 18, 1979, Ser. No. 58,524
Int. Cl.[3] B29D 27/00
U.S. Cl. 264—45.5 3 Claims



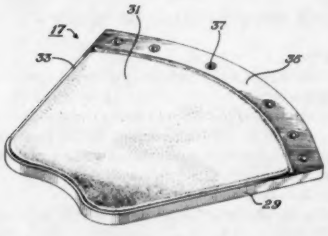
1. A process for molding a foamed thermoplastic article characterized by a foamed core, a non-foamed exterior shell, and a surface that faithfully and reproducibly replicates a predetermined portion of the inner surface of the mold which comprises: feeding as a charge a molten mixture of a thermoplastic polymer and a soluble gas foaming agent into a mold maintained at a temperature sufficiently low to cause the outer portion of said mixture to form a self-supporting exterior shell in said mold and at a volume sufficient, in the unfoamed state, to substantially fill said mold cavity; allowing the outer portion of the charge to cool in said cavity to form a self-supporting exterior shell while maintaining the mold cavity at a pressure above the foaming pressure of said mixture; thereafter releasing the pressure within the mold cavity to provide a temperature and pressure gradient to cause (i) the thermoplastic material therein to contract and (ii) gas desolubilization and expansion so as to balance the volume contraction of said charge which would otherwise have resulted from said gradients, to produce a foamed core and exterior solid shell; and removing the resultant article from said mold cavity.

4,255,369

METHOD OF CONSTRUCTING A WATER SKI FOOT SUPPORT

Barton K. Napier, Fort Worth, Tex., assignor to Nash Manufacturing, Inc., Fort Worth, Tex.

Filed Sep. 10, 1979, Ser. No. 74,149
Int. Cl.[3] B29D 27/04
U.S. Cl. 264—46.6 5 Claims



1. A method of constructing a water ski foot support comprising:

injection molding a backing of thermoplastic resin material with a raised rim on its inner side, and removing it from the injection mold;

supporting the backing in a horizontal position with its inner side facing upward;

pouring a foamable polyvinyl chloride plastisol resin onto the inner side of the backing with the rim acting as a mold for the plastisol resin, the plastisol resin being of a type that expands and forms into a solid cushion by heating;

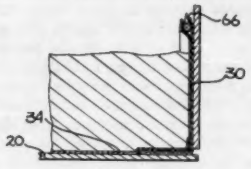
heating the backing and the plastisol resin at a temperature and for a time to cause the plastisol resin to expand and allowing the backing and plastisol resin to cool to form a solid cushion layer bonded to the inner side of the backing.

4,255,370

METHOD FOR MANUFACTURING FLAT TOP FOAM BUNS

Charles W. Morgan, Rolling Hills, California, Division of Ser. No. 868,848, Jan. 12, 1978, Pat No. 4,165,955, which is a continuation-in-part of Ser. No. 736,142, Oct. 27, 1976, Pat. No. 4,069,285. This application Feb. 23, 1979, Ser. No. 14,561

Int. Cl.[3] B29D 27/04
U.S. Cl. 264—51 13 Claims



1. A method for obtaining flat top molded foamed products in continuous open molding equipment having a conveyor system defining an open top trough in which is disposed at least one film member formed to have a bottom and two side regions to cover the bottom and at least part of the side walls defining the trough onto which foam reactants are dispensed to react in a foaming region to form a continuous foamed bun in the trough as the film member proceeds along the conveyor system, comprising the steps on:

(a) disposing continuous thin film tubular members, each having a tubular region at least adjacent one edge thereof, in a substantially horizontal orientation on the bottom of the trough at a position prior to the region the foam reactants are dispensed and with the outer edge of the tubular portion of each tubular film member generally parallel to and adjacent the plane of the sides of the trough;

(b) disposing a second film member having a width exceeding the width of the trough by an amount exceeding twice the depth of the foam reactants to be dispensed thereon and less than twice the height of rise of the foamed reactants onto the bottom of the trough and over the first and second tubular members at a position prior to the region the foam reactants are dispensed;

(c) turning the sides of the second film member upward to define a shallow trough for the foam reactants in the region the reactants are dispensed;

(d) drawing each tubular member upward at the sides of the trough in the foaming region to encourage the side regions of the foaming reactants in contact therewith upward; and

(e) slitting each tubular member substantially adjacent the region of maximum rise of the reactants so as to separate the tubular member and the guide.

4,255,371

PROCESS FOR PRODUCING OLEFINIC RESIN FOAMS

Nobuyoshi Shimoyashiki, Isehara; Teruo Masukawa, Fujisawa, and Fusao Imai, Kamakura, all of Japan, assignors to Japan Styrene Paper Corporation, Tokyo, Japan

Filed Jan. 15, 1979, Ser. No. 3,540
Claims priority, application Japan, Jan. 20, 1978, 53-50008
Int. Cl.[3] B29D 27/00
U.S. Cl. 264—54 7 Claims

1. A process for producing an olefinic resin foam which comprises forming a composition comprising an olefinic resin, a chemical blowing agent and a cross-linking agent into a non-cross-linked and unfoamed sheet-like or rod-like shaped article and cross-linking and foaming the resin by heating at a temperature of 220° to 240° C. in an oxygen-free atmosphere or in an atmosphere containing not more than 10% of oxygen.

4,255,372

PROCESS FOR THE PRODUCTION OF FOAM MATERIALS ON POLYOLEFIN BASIS

Werner Kühnel, Neunkirchen-Schoneshof, and Paul Spielau, Troisdorf-Eschmar, both of Fed. Rep. of Germany, assignors to Dynamit Nobel Aktiengesellschaft, Fed. Rep. of Germany

Filed Oct. 26, 1979, Ser. No. 88,524
Claims priority, application Fed. Rep. of Germany, Oct. 26, 1978, 2846620
Int. Cl.[3] B29H 7/20; C08J 9/22
U.S. Cl. 264—54 4 Claims

1. A process for the production of polyolefin foam materials from crosslinked polyolefin foam scraps which comprises mixing a polyolefin or a blend of a polyolefin with an elastomer and/or synthetic resins with an organic peroxide as the crosslinking agent and a blowing agent, the decomposition temperature of the crosslinking agent being below the decomposition temperature of the blowing agent, and optionally with customary additives; forming the mixture, at a temperature lying below the decomposition temperatures of the crosslinking agent and the blowing agent, into a first shaped article; subsequently crosslinking and expanding the first shaped article by heating to above the decomposition temperatures of the crosslinking agent and the blowing agent; obtaining scraps of said crosslinked polyolefin-containing foam material comminuting the crosslinked polyolefin-containing foam scraps; thereafter admixing the comminuted scraps with a synthetic resin on a polyolefin basis, and then compressing the admixture at a temperature lying below the decomposition temperature of the crosslinking agent to form an aggregate product; comminuting this product to form a particulate material; plasticizing this material at a temperature lying below the decomposition temperature of the crosslinking agent to form a second shaped article; and crosslinking and expanding the second shaped article by heating to above the decomposition temperatures of the crosslinking agent and of the blowing agent.

4,255,373

METHOD FOR MANUFACTURING HIGHLY REFRACTORY ALUMINUM AND MAGNESIUM OXIDE CERAMIC ITEMS

Viktor P. Kalinin, Slavyansky bulvar, 3, kv. 11, Moscow; Sergei P. Avdjukhin, ulitsa Jubileinaya, 10, kv. 46, Zheleznodorozhny Moskovskoi oblasti; Vsevolod I. Lebedev, ulitsa Tsandera, 4, korpus 2, kv. 11, Moscow; Viktor F. Zhilin, 10 ulitsa Sokolinoi Gory, 4, kv. 99, Moscow; Vladimir S. Frolov, ulitsa 11 Parkovaya, 10, kv. 58, Moscow; Jury V. Anisimov, prospekt Budennogo, 23, kv. 15, Moscow; Jury T. Slavin, ulitsa Tishinskaya, 1, kv. 6, Moscow, and Valentin N. Larionov, ulitsa Latsisa, 16, korpus 3, kv. 48, Moscow, all of U.S.S.R.

Filed Jun. 8, 1979, Ser. No. 46,791
Int. Cl.[3] F27D 7/06; C04B 35/04, 35/10
U.S. Cl. 264—65 2 Claims

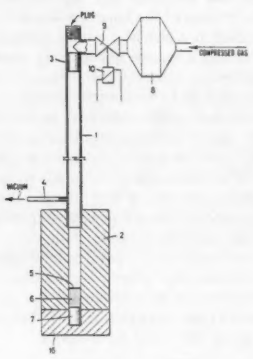
1. A method for manufacturing highly refractory ceramic items from aluminum and magnesium oxides, comprising mixing said oxides in the ratios of 65 to 72 wt. % aluminum oxide and 35 to 28 wt. % magnesium oxide, introducing the mixture into a mold having a heater at the center thereof, packing the oxides to form an item, drying said item by raising the temperature of the heater in air to 400°–450° C. at the rate of 30°–60° C./min. and under vacuum to a temperature of 950°–1050° C. at the rate of 30°–100° C./min, burning the item in an inert gas atmosphere heated to a temperature of 1800°–1850° C. at a rate equal to or higher than 100° C./min for a time sufficient to enable free separation of the item from the heater, burning said item under vacuum at the same temperature and cooling the burned item, the total manufacturing time being from 2 to 4 hours.

4,255,374

METHOD OF COMPACTING POWDER

Bo Lemcke, Lausanne, and Derek Raybould, Preverenges, both of Switzerland, assignors to Institut Cerac S.A., Ecublens, Switzerland

Filed Jun. 22, 1978, Ser. No. 918,143
Claims priority, application Switzerland, Jul. 4, 1977, 8204/77
Int. Cl.[3] B22F 3/14
U.S. Cl. 264—111 23 Claims



1. In a method of compacting powder comprising interweldable particles into a unitary structure by using a shock wave of such an amplitude as to create interparticle welding in the powder, said shock wave being generated by impacting an impact member against the powder which is supported by a support means in a compaction chamber,

the improvement comprising:

controlling the compacting pressure so that it exceeds a lower limit value defined by the following equation

$$s \cdot d\,(1-a) \cdot (bP)^2 \cdot (1+bP)^{\frac{1}{2}} > a^{5/2} b^{5/2} Ts\ Cp\ K\ \rho^{3/2}$$

where

s is the shape factor depending on the shape of the powder particles,

d is the size of the powder particles,

a is the initial functional density of the powder,

b is the compaction constant defined from the pressure density relation,

P is the compaction pressure,

Ts is the melting temperature of the resulting unitary structure

Cp is the specific heat of the resulting unitary structure,

K is the thermal conductivity of the resulting unitary structure, and

ρ is the density of the resulting unitary structure; and

controlling the duration of the compaction pressure following behind the shock wave by selecting the length and impedance of said impact member and said support means,

so that the shock wave is propagated through the powder with a shorter rise time than the time necessary for obtaining equalization of the overall temperature in the powder and so that the compacting pressure is maintained at least long enough for the welds on the powder particles to solidify;

the speed of the impact member relative to said powder being at least 300 m/sec at the instant of said impact.

4,255,375

PROCESS FOR THE PREPARATION OF DUSTLESS, READILY-DISPERSIBLE PIGMENT OR DYESTUFF GRANULES

Ian A. Macpherson, Paisley; John A. Stirling, Glasgow; Ian R. Wheeler, Houston, and James M. McCrae, Stewarton, all of Scotland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed May 29, 1979, Ser. No. 43,592

Claims priority, application United Kingdom, May 31, 1978, 25501/78

Int. Cl.[3] **C08L** *91/00;* **C09B** *67/08*

U.S. Cl. 264—117 **10 Claims**

1. A process for producing a pigment or dyestuff composition in the form of dustless readily dispersible granules, which process comprises contacting, with agitation, an aqueous dispersion of a pigment and a composition comprising one or more organic acids which are liquid at temperatures below 100° C. or their salts, at a pH value at which the acid is insoluble in water, the temperature being maintained during contacting above the melting point of the acid until the pigment has completely transferred into the organic phase; increasing the pH to a value suitable to render the acid soluble in water and recovering the resulting granules.

4,255,376

SOLVENT STRETCH PROCESS FOR PREPARING MICROPOROUS FILMS FROM PRECURSOR FILMS OF CONTROLLED CRYSTALLINE STRUCTURE

John W. Soehngen, Berkeley Heights, N.J., assignor to Celanese Corporation, New York, N.Y.

Filed Jun. 1, 1979, Ser. No. 44,805

Int. Cl.[3] **B29C** *11/00, 27/10*

U.S. Cl. 264—145 **19 Claims**

1. In a "solvent stretch" process for preparing an open-celled microporous polymeric film from a non-porous polymeric precursor film comprising a crystalline polymer having both an amorphous and a crystalline component, the improvement which comprises utilizing an olefinic homopolymer having (1) a molecular weight distribution ratio of about 3.8 to about 13, (2) optionally a nucleating agent incorporated therein in an amount of from about 0.01 to about 10% by weight of the polymer, and (3) a melt index of about 3 to about 20 when a nucleating agent is not employed, and from about 0.3 to about 20 when a nucleating agent is employed, to provide a precursor film having a spherulite size and orientation sufficient to provide a microporous film therefrom having an improved morphological structure.

4,255,377

PROCESS FOR PRODUCING LOW TENSILE FACTOR POLYESTER YARN

Gene P. Daumit; Alan Buckley, both of Charlotte, and Gerald W. Davis, Salisbury, all of N.C., assignors to Fiber Industries, Inc., Charlotte, N.C.

Division of Ser. No. 568,078, Apr. 14, 1975, abandoned. This application May 23, 1977, Ser. No. 799,851

Int. Cl.[3] **D01D** *5/12*

U.S. Cl. 264—176 F **3 Claims**

1. A process for the production of filamentary yarn structures characterized by controlled and balanced tensile characteristics and low tensile factor comprising

spinning polyethylene terephthalate having an intrinsic viscosity of at least 0.55 through a multifilament pack maintained at a temperature in the range of 280° to 295° C. to produce filaments of 1 to 8 dpf;

quenching the filaments to below the glass transition temperature;

passing said filaments through an annealing zone 1 to 9 ft. in length commencing 3 to 6 ft. from the spinning pack said annealing zone being maintained at a temperature of at least 200° C. up to the melting temperature;

simultaneously forwarding or taking up said filaments at a windup speed of 10000–15000 fpm;

and recovering yarn having a tensile factor of between 14 and 22, at a tenacity of between about 2.5 and 4.0 g/den. and an elongation of between about 25 and about 40 percent.

4,255,378

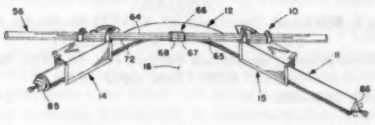
BENDING PLASTIC PIPE

Lee A. Miller, 15104 Hill Dr., Novelty, Ohio 44072, and John S. Curtis, 6435 Gates Mills Blvd., Mayfield Heights, Ohio 44124

Division of Ser. No. 841,714, Oct. 13, 1977, Pat. No. 4,156,588. This application Apr. 2, 1979, Ser. No. 26,412

Int. Cl.[3] **B29C** *17/02*

U.S. Cl. 264—322 **6 Claims**



1. A method of field forming a bend of a selected angle of curvature and a selected radius of curvature in plastic pipe, comprising: the steps of setting a jig which includes two interconnected linear inverted U-shape guides slidably mounted upon and angularly positionable with respect to an elongated support, said step of setting the jig including setting the guides to the proper width to conform to the O.D. of the pipe, slidably setting the guides the proper distance apart along the elongated support by selecting a proper scale corresponding to such selected angle of curvature from a plurality of axially parallel subscales on the elongated support corresponding respectively to different angular settings and slidably moving the guides along the elongated support to a position identified on such proper scale for such selected radius of curvature, and angularly setting the guides at a proper angular position with respect to the elongated support by using a protractor at each guide to determine the proper angular position of the guides with respect to the elongated support and rotating the guide to such thusly determined angular position; plugging the ends of the pipe to be bent; heating the pipe in the area of the bend; placing the pipe on a flat surface; lowering one of the guides over the pipe at the point where the bend is to begin; moving the free end of the pipe to form a smooth curve; and then placing the other guide over the pipe.

4,255,379

INJECTION MOLDING USING SCREW FOR PROCESSING HEAT SENSITIVE POLYMERIC MATERIALS

James D. Frankland, Jr., New Castle, Pa., assignor to New Castle Industries, Inc., New Castle, Pa.

Division of Ser. No. 797,828, May 17, 1977, abandoned. This application May 30, 1978, Ser. No. 913,972

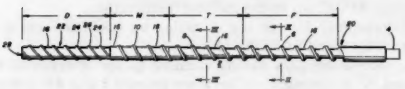
Int. Cl.[3] **B29F** *1/02*

U.S. Cl. 264—328.17 **7 Claims**

1. In the process of plasticating polyethyleneterephthalate in an injection molding machine which process includes the steps of feeding particulate polyethyleneterephthalate to the inlet zone of a plasticating screw, conveying said polyethyleneterephthalate along said screw from a zone of low average shear and low compression to a zone of high shear and

high compression, metering the flow of said polyethyleneterephthalate from said zone of high shear and high compression, discharging said polyethyleneterephthalate from said plasticating screw, the improvement comprising:

reducing the amount of acetaldehyde produced from the decomposition of said polyethyleneterephthalate by de-



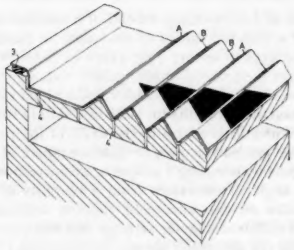
compressing said polyethyleneterephthalate following said metering step but before said discharge step while pumping said polyethyleneterephthalate along said screw at a rate at least equal to the pumping rate of said polyethyleneterephthalate in said zone of high shear and high compression.

4,255,380

METHOD AND APPARATUS FOR MANUFACTURING SIGNS OR THE LIKE CARRYING INFORMATION WHICH IS DIFFERENT FOR DIFFERENT VIEWING ANGLES

Mats E. Björkland, Banergatan 27, S-115 22 Stockholm, Sweden

Filed Feb. 8, 1979, Ser. No. 10,347
Claims priority, application Sweden, Feb. 16, 1978, 7801808
Int. Cl.³ B29C *17/04*; G09F *19/14*
U.S. Cl. 264—505 **5 Claims**



1. In a method of manufacturing signs or the like carrying displays which are different for different viewing angles, and of the kind which has the configuration of a plurality of parallel ridges with intermediate valleys, a said display being divided into strip-like portions applied in sequence to one side of said ridges, whereby, upon observation obliquely from said one side they appear substantially as an uninterrupted display, while strip-like portions of another display are applied to the other side of said ridges, the steps of

(a) dividing each of two images into parallel strips of predetermined and equal widths;

(b) composing a third image by placing said parallel strips from both first-mentioned images side by side in alternating sequence;

(c) reproducing said third image on a plastic sheet;

(d) placing said plastic sheet, provided with said third image, in a mold formed with parallel ridges and intermediate valleys corresponding to said configuration of the finished product, the distance between successive ridge peaks being twice as large as said predetermined width of said strips;

(e) locating said sheet so that each ridge peak in said mold is substantially opposite the boundary line between two strips in said third image;

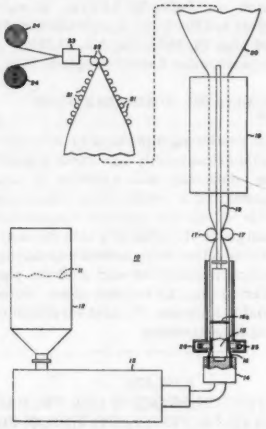
(f) heat deforming said sheet against the surface of said mold, while points lying against the ridge peaks remain undisplaced, the zones between said peaks being deformed so that they are brought into substantive engagement with the valleys between the ridges.

4,255,381

TEXTURED SURFACE POLYPROPYLENE FILM

John W. Eustance, S. Glens Falls; Stanley Y. Hobbs, Scotia, and Emilie L. Carley, Hartford, all of N.Y., assignors to General Electric Company, Hudson Falls, N.Y.

Continuation-in-part of Ser. No. 686,832, May 17, 1976, abandoned, which is a division of Ser. No. 554,070, Feb. 28, 1975, abandoned. This application Mar. 15, 1979, Ser. No. 20,877
Int. Cl.³ B29F *3/08*
U.S. Cl. 264—519 **10 Claims**



5. In a process for producing polypropylene film wherein molten polypropylene material is extruded through a die into a stalk form and said stalk is cooled to crystallize the polypropylene, after which the stalk is passed through a heating zone and thereafter is biaxially stretched into a thin film, the improvement of producing a predetermined textured surface on said film comprising:

(a) continuously effecting an elevated and constant predetermined temperature at said extruder of between about 425° F. and 475° F.;

(b) maintaining a predetermined constant tension in said biaxially stretching process to reduce the thickness of said film below about 1 mil (25.4μ);

(c) reducing said extrusion temperature and increasing said tension to enhance and maintain an increased growth of type III crystal structure layer on said stalk; and

(d) causing said type III crystal structure to melt in said heating zone while being biaxially stretched to provide a textured surface on said film defined by a space factor of above about 5.0%.

4,255,382

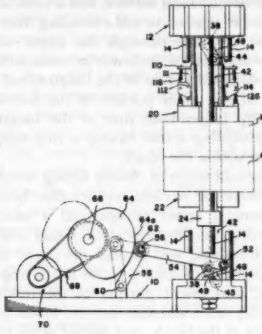
THERMOFORMING MACHINE WITH AUTOMATICALLY MECHANICALLY OPERATED WEB STRIPPING ELEMENT

Albert W. Arends, and Ronald E. Henke, both of Gladwin, Mich., assignors to Leesona Corporation, Beaverton, Mich.

Filed Mar. 20, 1980, Ser. No. 131,880
Int. Cl.³ B29C *17/00, 7/00*
U.S. Cl. 264—544 **12 Claims**

1. In a differential pressure thermoforming machine having a frame; mold assemblies mounted thereon for relative movement along an axis between a mold open and a mold closed position; one of said assemblies having a female mold with a mold cavity; means for feeding a heated deformable plastic

web to be formed between said mold assemblies and adjacent said mold when the latter are in a mold open position; a stripper element for the female mold for restraining the web from moving with the female mold when the latter is moved toward mold open position; a stop supported by said frame; a latch carried by said stripper and movable through a path of travel from a withdrawn position to a stop engaging position in



which the latch and stripper are initially prevented by the stop from moving in the withdrawal path of the female mold; and mechanism carried by the female mold assembly operable to effect movement of the latch to withdrawn position after a predetermined axial withdrawal of the female mold wherein the web is stripped from the mold to permit the stripped element to commence to move with the female mold assembly.

4,255,383

MULTICHAMBER UV PURIFYING PROCESS

Günther O. Schenck, Bismarckstrasse 31, 433 Mülheim, Fed. Rep. of Germany

Filed Jul. 11, 1978, Ser. No. 923,710

Claims priority, application Fed. Rep. of Germany, Aug. 6, 1977, 2735550

Int. Cl.³ A61L *2/10, 2/16, 2/24*

U.S. Cl. 422—24 **13 Claims**

1. A process of purifying a fluid medium with ultraviolet radiation wherein the medium is passed through an apparatus including a photoreactor wherein it is exposed to the ultraviolet radiation and thereby irradiated, said process being characterized by:

recirculating the irradiated medium through the apparatus and back through said photoreactor; drawing off a portion only of the recirculated medium from the apparatus to serve as the purified medium; concurrently with said withdrawal adding unpurified medium, in an amount equivalent to that so withdrawn, to the apparatus to be mixed with the irradiated medium remaining therein to produce a mixture of irradiated and nonirradiated medium; and irradiating said mixture while it is being recirculated through the apparatus.

4,255,384

MULTILAYERED INTEGRAL ELEMENT FOR THE CHEMICAL ANALYSIS OF THE BLOOD

Masao Kitajima; Fuminori Arai, and Asaji Kondo, all of Osaka, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

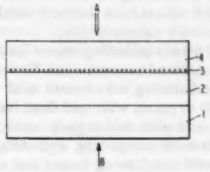
Filed Aug. 14, 1979, Ser. No. 66,363

Claims priority, application Japan, Aug. 14, 1978, 53/98900; Aug. 14, 1978, 53/98902

Int. Cl.³ G01N *31/22*

U.S. Cl. 422—57 **16 Claims**

1. An integral multilayered element for the chemical analysis of the blood comprising a combination of a porous spreading layer, a reagent layer, and a radiation-blocking layer, said



radiation-blocking layer being water-permeable and containing at least one elemental metal or an alloy thereof.

4,255,385

REAGENT AND TEST KIT FOR DETERMINING GLYCOSYLATED HEMOGLOBIN

Stephen D. Stroupe, and Edwin G. Moore, both of Libertyville, Ill., assignors to Abbott Laboratories, North Chicago, Ill.

Continuation of Ser. No. 973,368, Dec. 26, 1978, Pat. No. 4,200,435. This application Oct. 23, 1979, Ser. No. 87,367

Int. Cl.³ G01N *33/72*

U.S. Cl. 422—61 **5 Claims**

1. A test kit for determining glycosylated hemoglobin in blood samples comprising reagent containers holding separate or in combination a red blood cell lysing agent, an oxidizing agent for oxidizing hemoglobin to methemoglobin, a heme-binding ligand, an allosteric site binding substance which binds to the allosteric site of non-glycosylated hemoglobin.

4,255,386

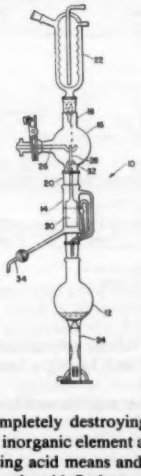
METHOD AND APPARATUS FOR DESTROYING ORGANIC MATTER TO FACILITATE TRACE INORGANIC ELEMENT ANALYSIS

Myron M. Schachter, Washington, D.C., and Kenneth W. Boyer, Springfield, Va., assignors to The United States of America as represented by the Deptartment of Health, Education and Welfare, Washington, D.C.

Filed Nov. 30, 1978, Ser. No. 964,969

Int. Cl.³ B01L *11/02;* **B01D** *11/02;* **G01N** *31/00, 33/48*

U.S. Cl. 422—101 **1 Claim**



1. Apparatus for completely destroying organic matter in order to facilitate trade inorganic element analysis, comprising:

flask means for housing acid means and an organic matrix;

means disposed beneath said flask means for heating said acid means so as to distill the same;

condenser means disposed above said flask means for condensing said distillation vapors;

means disposed between said flask means and said condenser means for controlling the return of said condensed vapors to said flask means such that said distillation-condensation cycle proceeds automatically;

said control means including means for delaying said return of said condensed vapors to said flask for a predetermined time period during which said acid within said flask is distilled to dryness, with said flask being heated to a dull red state, and with said organic matrix being charred;

said delay means comprising siphoning means interposed between said condensing means and said flask means;

said siphoning means including adjustable means being adjustable so as to properly control said return of said acid condensate to said flask means in said time-delayed manner;

said siphoning means comprising a Soxhlet extractor disposed between said flask means and said condenser means having said adjustable means disposed therein, said adjustable means comprising a volume displacement cylinder adjustably disposed within said extractor having dimensions approximating that of the inside wall of said soxhlet extractor for determining the commencement time of said siphoning of said acid condensate, said ajustable means further comprising lever and link means located within a housing means between said soxhlet extractor and said flask means, said cylinder being suspended in said soxhlet extractor by lever and link means regulating the position of the cylinder within said soxhlet extractor.

4,255,387

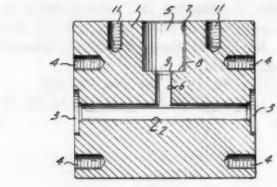
HIGH PRESSURE TUBULAR REACTOR APPARATUS

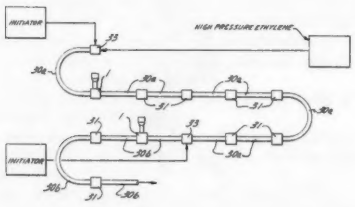
Harold F. Gardner, Odessa, Tex., assignor to El Paso Polyolefins Company, Paramus, N.J.

Filed Dec. 29, 1978, Ser. No. 974,287

Int. Cl.³ G05D *16/00;* **F16K** *17/40;* **B01J** *4/00, 19/00*

U.S. Cl. 422—113 **8 Claims**





1. A high pressure tubular polymerization reactor containing a plurality of bends and having a least two reaction zones, comprising:

a plurality of tubular sections each having an inside diameter in the range of from about 0.5 to about 3 inches; connection block devices between adjacent tubular sections; means for introducing monomer feed to the inlet of each of said reaction zones; separate means for introducing polymerization initiator to the inlet of each of said reaction zones, and associated with each reaction zone a singular rupture disc disposed within a connection block device positioned downstream of said inlet at a distance of from about 24 to about 40 feet therefrom, wherein the connection device containing the rupture disc comprises a rectangular block having an upper surface, a bottom surface and two pairs of opposing side surfaces, said block being provided with a longitudinal bore extending from one side surface to its opposing surface, and a centrally positioned lateral bore in relation to and extending from said longitudinal bore upwards through the upper surface of the block, the diameter of the lower portion of the lateral bore being about equal to that of the longitudinal bore and the diameter of the upper portion of the lateral bore being substantially larger than that of the longitudinal bore, thereby providing a seat having a ring shape cross sectional area within the block;

supported by said seat and closely fitting within said lateral bore a removable necked rupture disc holder having a larger diameter upper portion and a smaller diameter lower portion, said upper portion of said holder extending upwards from said seat to near the upper surface of the block, thereby providing a recess in the upper surface of the block, said lower portion of the holder extending downwardly from said seat into the lower portion of the lateral bore of the block, said holder being provided with a lateral bore having a relatively small diameter in the lower portion of the holder and a relatively large diameter in the topmost portion of the holder;

a support ring affixed to the lower portion of the holder and having about the same cross sectional dimensions as those of said lower portion of the holder;

a rutpure disc affixed at its periphery to the support ring and positioned at the junction of the lateral bore of the block and the uppermost portion of the longitudinal bore;

means for providing sealing contact between the rupture disc holder and the seat within the block.

4,255,388

APPARATUS FOR THE PRODUCTION OF H_2S FROM SO_2 OBTAINED FROM FLUE GAS

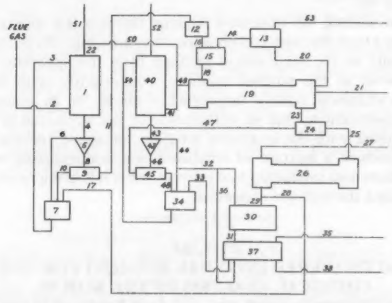
Ralph Miller, Pleasantville, N.Y., assignor to DTPM Corporation, Maple Row, N.Y.

Division of Ser. No. 807,044, Jun. 16, 1977, Pat. No. 4,141,961.

This application Nov. 15, 1978, Ser. No. 960,929

Int. Cl.³ B01D *53/34;* **C01B** *17/16*

U.S. Cl. 422—168 **8 Claims**



1. A system for removing the sulfur dioxide contained in a flue gas and for recovery of hydrogen sulfide comprising:

(a) a gas contacting device for contacting said flue gas with an aqueous, alkaline, sodium-carbonate containing reaction medium essentially saturated with sodium sulfite to react the bulk of the sulfur dioxide and a portion of the oxygen with the carbonate values to form a slurry of

sodium sulfite and sodium sulfate dispersed in the reaction medium, the sodium and alkalinity being supplied to said reaction medium by the addition of recycled solid sodium carbonate, said gas contacting device having inlet means for receiving said flue gas and for receiving said reaction medium, and outlet means for discharging the gas and for discharging the reaction medium;

(b) a first separating means for separating sodium sulfite and sodium sulfate crystals from the reaction medium, said separating means having an inlet and an outlet;

(b') first conveying means for conveying the reaction medium from the outlet of said gas contacting device to the inlet of said first separating means;

(c) a reducing means for reducing the separated sodium sulfite and sodium sulfate crystals to solid sodium sulfide, said reducing means having an inlet and an outlet;

(c') second conveying means for conveying the separated crystals from the outlet of said first separating means to the inlet of said reducing means;

(d) a forming means for forming an intimate blend of said solid sodium sulfide with solid sodium bicarbonate, said forming means having an inlet and an outlet;

(d') third conveying means for conveying the solid sodium sulfide from the outlet of said reducing means to the inlet of said forming means;

(e) a heating means for heating said blend in the substantial absence of air to a temperature at which sodium bicarbonate would be converted to sodium carbonate and carbon dioxide to form gaseous hydrogen sulfide and dry, solid, anhydrous sodium carbonate, said heating means having an inlet and an outlet;

(e') fourth conveying means for conveying said blend from the outlet of said forming means to the inlet of said heating means;

(f) a recovering means for recovering the gaseous hydrogen sulfide, said recovering means having an inlet;

(f') fifth conveying means for conveying gaseous hydrogen sulfide from the outlet of said heating means to the inlet of said recovering means;

(g) an adding means for adding at least a portion of the sodium carbonate formed by said heating means to a sodium bicarbonate saturated solution for carbonating with carbon dioxide to form a slurry composed of solid particles of sodium bicarbonate disposed in said solution, said adding means having an inlet and an outlet;

(g') sixth conveying means for conveying said portion of the sodium carbonate from the outlet of said heating means to the inlet of said adding means;

(h) a second separating means for separating particles of sodium bicarbonate from the slurry formed by said adding means, said second separating means having an inlet and an outlet;

(h') seventh conveying means for conveying the slurry from the outlet of said adding means to the inlet of said second separating means; and

(h'') eighth conveying means for conveying the separated particles from the outlet of said second separating means to the inlet of said forming means.

4,255,389

APPARATUS FOR RAPID MACHINE COMPOSTING OF SEWAGE SLUDGE

Hermann Jung, Viersen, and Günter Spennes, Düren, both of Fed. Rep. of Germany, assignors to Kutsch-Consult GmbH, Düren, Fed. Rep. of Germany, by said Günter Spennes

Continuation of Ser. No. 815,375, Jul. 13, 1977, abandoned, which is a division of Ser. No. 680,369, Apr. 26, 1976, abandoned. This application Aug. 1, 1979, Ser. No. 62,506

Claims priority, application Fed. Rep. of Germany, May 2, 1975, 2519618

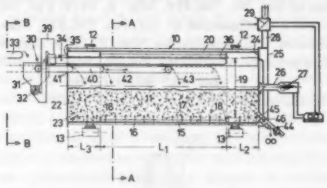
Int. Cl.[3] **B01J** *8/10*; **C05F** *7/00*

U.S. Cl. 422—209 **9 Claims**

1. An apparatus for the rapid machine composting of sewage sludge including a composting drum rotatable about a substantially horizontal axis and comprising:

(a) premixing means located outside said drum and including a mixing vessel, means for continuously delivering material to be composted to said mixing vessel;

(b) means for feeding composted sludge from said drum back to said mixing vessel including a plurality of radially extending carrier elements disposed around the inner face of said drum for moving composted sludge in the direction of rotation of said drum, a guide plate disposed adjacent the top of said drum and spaced from the inner surface thereof and cooperating with said carrier elements to catch the moving composted sludge, and a conveyor belt positioned



inside said drum and extending longitudinally in the upper section of said drum interior above the level of the sludge compost and below said guide plate, said conveyor belt adapted to deliver composted sludge to said mixing vessel;

(c) a variable length conveyor adapted to receive sludge from said mixing vessel and extending longitudinally into the interior of said drum above the level of the sludge compost and operable to continuously feed sludge from said mixing vessel into said drum;

(d) means for supplying and discharging air, heat, and moisture to and from the sludge compost inside said drum; and

(e) means independent of said feeding means for continuously discharging composted material from said drum.

4,255,390

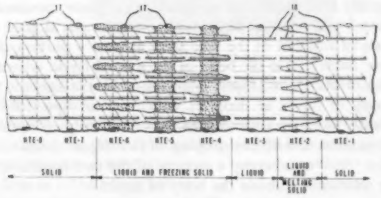
CORRUGATED INTERFACE ZONE REFINER

Philip J. Rennolds, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 896,431, Apr. 14, 1978, Pat. No. 4,196,042. This application Jul. 12, 1979, Ser. No. 57,115

Int. Cl.[3] **C30B** *35/00*

U.S. Cl. 422—250 **6 Claims**



1. A zone melting apparatus comprising an elongated sample-holding container which is traversed by a series of heat transfer elements each comprised of one or more heat transfer tubes to internally heat and/or cool the sample contained in said container, said elements having a plurality of thermally conducting fins spaced regularly at fixed positions along the tubes of the elements and extending into the sample in planes parallel to the container axis, and means to regulate the flow of hot or cold fluid through each of the various heat transfer elements thereby producing at least one molten zone bounded on opposite sides by solid material with a corrugated freezing interface therebetween and means to switch the fluids through each heat transfer element from hot to cold and cold to hot in

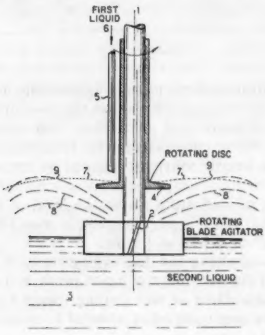
order to successively heat and cool different portions of the sample thereby moving the molten zone and the corrugated freezing interface along the axis through the sample, in which the ratio of the center distance D between adjacent heat transfer elements and the distance d between adjacent fins of a given element is between about 1 and about 6 and the fin dimension W parallel to the axis of the container is greater than ¾ D.

4,255,391

APPARATUS FOR INTRODUCING AND MIXING A LIQUID IN AN ESSENTIALLY LIQUID MEDIUM

Michel Barloy, Rouen, France, assignor to Rhone-Poulenc Industries, Paris, France

Division of Ser. No. 746,419, Mar. 8, 1979, Pat. No. 4,199,557, which is a continuation of Ser. No. 555,931, Mar. 6, 1975, abandoned. This application Mar. 8, 1979, Ser. No. 18,750
Claims priority, application France, Mar. 13, 1974, 74 08520
Int. Cl.³ B01D *11/04*
U.S. Cl. 422—259 **6 Claims**



1. Apparatus for introducing and mixing a first liquid with a second liquid in which the latter is present as a body of liquid confined within an enclosure, means for flowing the first liquid in a linear stream downwardly towards the body of the second liquid, a disc mounted for rotational movement located in spaced relation above the body of liquid, means for rotating the disc at high speed in the path of the downwardly moving stream of the first liquid whereby the stream of the first liquid is intercepted by the rotating disc and thrown centrifugally outwardly from the disc as droplets, an agitator mounted for rotational movement at high speed about an axis aligned with the axis of rotation of the disc with at least a portion of the agitator immersed in the body of the second liquid whereby a portion of the second liquid is displaced by the agitator from the body of liquid as droplets which spread upwardly and outwardly along an arcuate path above the body of liquid and which intersects with the droplets of first liquid thrown from the disc member whereby a mixture of the two liquids occurs at the intersection above the body of liquid.

4,255,392

METHOD OF SEPARATING IRON FROM URANIUM

Peter T. Chiang, Monroeville, Pa., assignor to Wyoming Mineral Corp., Lakewood, Colo.

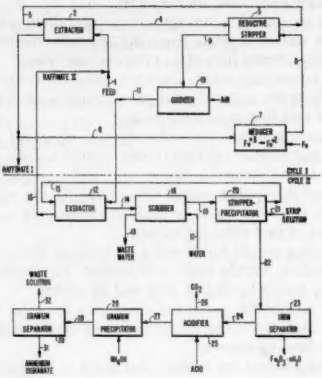
Filed Jul. 13, 1978, Ser. No. 924,422
Int. Cl.³ C22B *60/02*; B01B *11/00*
U.S. Cl. 423—11 **15 Claims**

1. In a process for extracting uranium with an organic solvent, a method of separating the extracted uranium from iron contamination in the organic extract, comprising:

(1) stripping said organic extract with an aqueous solution containing:

(A) plus about 10 to about 100 mole % in excess, where the concentration of carbonate ion is less that about 1 mole/l

(B) at least three moles of hydroxyl ion per mole of iron plus sufficient hydroxyl ion to neutralize said extract if it is acidic;



(C) a cation selected from the group consisting of ammonium, alkali metal, and mixtures thereof in an amount about stoichiometric to the sum of said carbonate and hydroxyl ions; and

(2) separating any $Fe_2O_3.nH_2O$ precipitate formed in said aqueous solution.

4,255,393

METHOD OF PRECIPITATING ADU

Peter T. Chiang, Monroeville, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Apr. 30, 1979, Ser. No. 34,309
Int. Cl.³ C01G *1/00, 56/00*
U.S. Cl. 423—15 **12 Claims**

1. In a method of precipitating ammonium diuranate by the addition of ammonia gas or a solution of ammonium hydroxide to an aqueous solution of uranyl fluoride, the improvement which comprises increasing the settling rate and reducing the particle size of the precipitate by conducting said precipitation in the presence of about 0.05 to about 0.5 grams per liter of an acrylic polymer.

4,255,394

PROCESS FOR THE SEPARATING OF RARE EARTHS

Jacques Helgorsky, Frepillon, and Alain Leveque, Paris, both of France, assignors to Rhone-Poulenc Industries, Paris, France

Filed Feb. 26, 1979, Ser. No. 15,296
Claims priority, application France, Mar. 10, 1978, 78 06926
Int. Cl.³ C01F *17/00*
U.S. Cl. 423—21.5 **14 Claims**

1. A process of separating by extraction from an aqueous solution one element from another, said elements being selected from the group consisting of the rare earths and yttrium, said elements existing in the trivalent state, said elements being contained as a mixture of at least two of said elements in said aqueous solution, which process comprises, contacting the said aqueous solution containing said mixture with an organic phase containing at least one substituted hydroxyquinoline having at least one hydrocarbon radical substituent, wherein the pH of said aqueous solution in contact with said organic phase is between about 3 and 8.

4,255,395

SOLVENT-EXTRACTION PROCESS FOR RECOVERY AND SEPARATION OF METAL VALUES

Lawrence V. Gallacher, East Norwalk, and Rachelle M. Rydzik, Easton, both of Conn., assignors to King Industries, Inc., Norwalk, Conn.

Continuation-in-part of Ser. No. 892,327, Mar. 31, 1978, Pat. No. 4,166,837. This application Aug. 30, 1979, Ser. No. 70,922
The portion of the term of this patent subsequent to Sep. 4, 1996, has been disclaimed.
Int. Cl.[3] C01G *49/00, 51/00, 53/00, 3/00*
U.S. Cl. 423—24 16 Claims

1. A process for recovering a first cationic metal value selected from the group consisting of copper (II), nickel (II), iron (III) and cobalt (II) from an aqueous solution comprising a pair of said first cationic metal value and a second cationic metal value, said process comprising contacting said aqueous solution at an acidic pH with a solvent-extractant comprising

(i) a 5-alkylbenzotriazole, the alkyl groups of which contain from 4 to 18 carbon atoms; and

(ii) a water-immiscible solvent for (i) and metal complexes thereof to provide a solution of said metal value in said solvent-extractant;

separating the solution thus formed from the aqueous raffinate depleted in said first metal value; and recovering said first metal value from said separated solution.

16. A process for recovering a first cationic metal value from an aqueous solution comprising a pair of said first cationic metal value and a second cationic metal value, said pair being selected from the group consisting of copper (II) and cobalt (II), copper (II) and nickel (II), copper (II) and iron (III), copper (II) and zinc (II) and cobalt (II) and zinc (II), said process comprising contacting said aqueous solution at a pH of below 6.0 with a solvent-extractant comprising

(i) a 5-alkyl-1H-benzotriazole, the alkyl groups of which contain from 4 to 18 carbon atoms; and

(ii) a water-immiscible solvent for (i) and metal complexes thereof to provide a solution of said metal value in said solvent-extractant; separating the solution thus formed from the aqueous raffinate depleted in said first metal value; and recovering said first metal value from said separated solution.

4,255,396

PROCESS FOR SEPARATING MOLYBDENUM VALUES FROM TUNGSTEN VALUES

Tai K. Kim, Bradford, Pa., assignor to GTE Products Corporation, Stamford, Conn.

Filed Dec. 18, 1979, Ser. No. 105,002
Int. Cl.[3] C01G *39/00, 41/00*
U.S. Cl. 423—54 1 Claim

1. A process for separating molybdenum values from tungsten values comprising forming an acid solution of molybdate ions and tungstate ions at a pH of from about 1 to about 3, contacting said solution with an organic extractant consisting essentially of from about 20 to 60 volume percent di-2-ethylhexyl phosphoric acid as an active extractant, an effective amount up to less than about 5 volume percent of said active extractant of dinonylnaphthalene sulfonic acic as a modifier for increasing the efficiency of extraction of molybdate ions, tartaric acid as a complexing agent, and the remaining volume portion of said organic extractant being a water insoluble organic solvent, said contacting being for a sufficient period of time to extract molybdenum values from said solution.

4,255,397

PROCESS FOR REMOVING TUNGSTEN FROM CEMENTED TUNGSTEN CARBIDE

Brice E. Martin; Joseph E. Ritsko, and Howard L. Acla, all of Towanda, Pa., assignors to GTE Products Corporation, Stamford, Conn.

Filed Dec. 21, 1979, Ser. No. 106,183
Int. Cl.[3] C01G *41/00*
U.S. Cl. 423—61 5 Claims

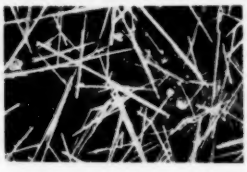
1. In a process for recovering tungsten from cemented tungsten carbide wherein the cemented tungsten carbide is oxidized by heating in air at a temperature of from about 800° C. to about 900° C. for a time sufficient to form an oxidized product and the oxidized product is digested in an aqueous solution of sodium hydroxide at a temperature greater than about 140° C. and under a pressure greater than about 50 pounds per square inch to form a soluble portion and an insoluble portion, the improvement comprising oxidizing said tungsten carbide by heating in an oxygen containing atmosphere for a period less than about ten hours, mixing the insoluble portion with from about 50 to about 150 parts of sodium carbonate per 100 parts of insoluble portion to form a resulting mixture, roasting the resulting mixture at a temperature below the fusion point of the mixture in an atmosphere containing oxygen to oxidize the insoluble portion and form another product and leaching the other product with water to recover soluble tungsten values.

4,255,398

NOVEL ETTRINGITE WHISKERS, PRODUCTION AND USES

Minoru Tanaka; Genzo Hashizume; Hiroshi Matsui, and Satoru Nakagawa, all of Kobe, Japan, assignors to Hyogo Prefectural Government of Japan, Kobe, Japan

Continuation-in-part of Ser. No. 885,554, Mar. 13, 1978, abandoned, and Ser. No. 885,555, Mar. 13, 1978, abandoned. This application Jun. 26, 1979, Ser. No. 52,140
Claims priority, application Japan, Mar. 15, 1977, 52-29088; Mar. 15, 1977, 52-29089
Int. Cl.[3] C01F *11/46;* C01G *28/02;* C04B *7/32, 13/00*
U.S. Cl. 423—117 4 Claims



1. A method of synthesizing ettringite crystal whiskers which comprises:

preparing a slurry by mixing together at least 10 parts by weight of water to one part by weight of a starting material mixture comprising

a. lime as a CaO component

b. aluminous material as a Al_2O_3 component

c. a $CaSO_4$ precursor supplying component selected from the group consisting of calcium sulphite,

and a mixture of gypsum and calcium sulphite with the ingredients in said starting material being adjusted so that the mole ratio of CaO, and said $CaSO_4$ component in said slurry is 1.3 to 4.5:1:2.3 to 4.3,

effecting oxidation by blowing air into, and thereby agitating, the slurry at a temperature between about 0° C. to 100° C., and a blowing air pressure of 2 to 4 Kg/cm^2, and

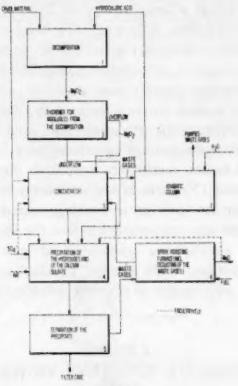
filtering the thus oxidized slurry to separate ettringite crystal whiskers having a diameter of 1 to 2 μm, a length of 50 to 100 μm and an aspect ratio of about 30 to 50.

4,255,399

PROCESS FOR THE RECOVERY OF MAGNESIUM OXIDE OF HIGH PURITY

Michael Grill, Leoben, and Helmut Grohmann, St. Jakob bei Mixnitz, both of Austria, assignors to Veitscher Magnesitwerke-Actien-Gesellschaft, Vienna, Austria

Filed May 8, 1979, Ser. No. 37,065
Claims priority, application Austria, May 8, 1978, 3328/78
Int. Cl.[3] C01F 5/10
U.S. Cl. 423—164 12 Claims



1. A process for the production of magnesium oxide of high purity from contaminated magnesium-containing starting materials on an industrial scale, comprising

(1) dissolving a magnesium-containing starting material in hydrochloric acid to produce a magnesium chloride brine;

(2) removing undissolved residue from the magnesium chloride brine produced in step (1);

(3) concentratng the magnesium chloride brine obtained from step (2);

(4) precipitating the remaining impurities from the magnesium chloride brine of step (3) by adjusting the pH of the magnesium chloride brine to a pH range favoring such precipitation, by contacting said magnesium chloride brine with an oxidizing agent and by adding a source of sulfate ion to the magnesium chloride brine;

(5) removing precipitated impurities from the magnesium chloride brine produced in step (4); and

(6) thermally decomposing the magnesium chloride brine of step (5) to produce magnesium oxide.

4,255,400

PROCESS FOR OXIDIZING OXIDES OF SULFUR

Nobuyasu Hasebe, Los Angeles, Calif., assignor to New World Business Corporation, North Hollywood, Calif.

Continuation-in-part of Ser. No. 804,849, Jun. 8, 1977, abandoned. This application Jul. 3, 1978, Ser. No. 921,782
Int. Cl.[3] C01B 17/60; B01D 53/34
U.S. Cl. 423—235 20 Claims

1. The process of oxidizing a sulfite ion in a solvent medium in a reaction zone comprising reacting said sulfite ion with a quinone compound in its hydroquinone state and with oxygen, converting said sulfite ion into a sulfate ion.

4,255,401

TREATMENT OF EXHAUST GAS CONTAINING SULFUR OXIDES AND NITROGEN OXIDES

Kohki Nomoto, and Yoshihiko Kudo, both of Iwaki, Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 3, 1978, Ser. No. 957,441
Claims priority, application Japan, Nov. 11, 1977, 52-135836
Int. Cl.[2] B01D 53/34
U.S. Cl. 423—235 4 Claims

1. In a method of treating an exhaust gas at a high temperature containing nitrogen oxides and sulfur oxides by bringing the exhaust gas into contact with an absorbing solution containing at least an iron chelate salt and potassium sulfite to thereby convert said nitrogen oxides and sulfur oxides into a salt mixture of potassium imidodisulfonate, potassium dithionate and potassium sulfate, the improvement comprising the following steps:

said exhaust gas at a high temperature is cooled to a temperature below 80° C. before bringing it into contact with the absorbing solution;

the concentration of potassium sulfite as the sulfite component in said absorbing solution is kept at least at 0.8 mol/kg; and

said salt mixture produced in said absorbing solution is crystallized by cooling and separated by filtering said absorbing solution.

4,255,402

SULPHUR DIOXIDE GAS SCRUBBING PROCESS

Philip S. Lowell, 6307 Shoal Creek West, Austin, Tex. 78731

Filed Aug. 13, 1979, Ser. No. 66,008
Int. Cl.[3] C01B 17/00
U.S. Cl. 423—242 9 Claims

1. A regenerable process for removing sulfur dioxide from a sulfur dioxide-containing gas stream which comprises

(i) contacting the gas with an aqueous sulfite solution characterized by a sulfite anion concentration sufficient to produce an alkalinity of 0.2 to 4.0, magnesium cation in an amount to substantially saturate the solution with respect to magnesium sulfite, and one or more other cations whose sulfite salts are more soluble than magnesium sulfite, thereby sorbing sulfur dioxide, and converting sulfur dioxide and sulfite to bisulfite;

(ii) treating the bisulfite-containing solution with magnesium oxide or hydroxide, thereby reconverting bisulfite to sulfite, precipitating magnesium sulfite, and regenerating the solution;

(iii) separating precipitated magnesium sulfite from the regenerated solution; and

(iv) recycling and reusing the resulting aqueous sulfite solution for scrubbing the gas.

4,255,403

MAGNETICALLY STABILIZED FLUID CROSS-FLOW CONTACTOR HAVING SUPPORT MEANS AND PROCESS FOR USING THE SAME

Francis X. Mayer; Martin O. Gernand, both of Baton Rouge, La., and William W. Lincoln, Newark, Ohio, assignors to Exxon Research and Engineering Co., Florham Park, N.J.

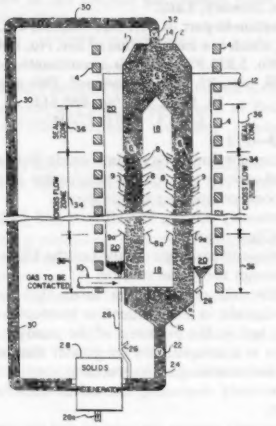
Filed Jul. 31, 1979, Ser. No. 62,538
Int. Cl.[3] B01J 8/00
U.S. Cl. 423—244 14 Claims

10. In a process for contacting a gaseous fluid with a plurality of solid, discrete magnetizable particles comprising:

(a) continuously introducing and removing a bed of solid, discrete magnetizable fluidizable particles in a porous chamber in a descending manner or direction;

(b) structuring and controlling the porosity in said bed by applying a magnetic field to said bed in a manner such that the magnetic field is substantially colinear with an external force field within said chamber; and

(c) passing a gaseous fluid through the magnetized particles with a velocity component substantially perpendicular to the external force field and the applied magnetic field within said chamber, the improvement which comprises



providing at least one support means positioned near or adjacent to said opening means, said support means extending into said chamber in a manner to provide at least some support for said descending bed.

4,255,404

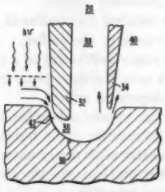
ISOTOPIC SEPARATION

Cheng-lin Chen, Penn Hills, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Dec. 22, 1977, Ser. No. 863,202

Int. Cl.[2] C01G *43/06*; B01D *53/24, 53/00, 59/00*; B01J *1/10*

U.S. Cl. 423—258 **2 Claims**



1. A method for separating isotopic species in an isotopic mixture including a first species having a first isotope and a second species having a second isotope, said method comprising:

(a) a selectively exciting said first species in preference to said second species:

(b) reacting some of said selectively excited first species with a predetermined radiation so as to promote selective dissociative ionization of said first species resulting in a product some of said product being a positive ion, said product also including a neutral fragment and an electron;

(c) reacting some of said selectively excited first species with said product electron so as to promote dissociative electron attachment of some other of said first species resulting in some of said product being a negative ion;

(d) reacting said product negative ion with said product positive ion so as to form a product neutral species of differing mass than said first or second species; and

(e) flowing said mixture through a device shaped and operable to impart an angular velocity to the constituents of said flowing mixture such that, as a result of said difference in mass, said product neutral species traverses a preferential flow path different than the flow path of the balance of said mixture.

2. A method for separating isotopic species in an isotopic mixture including a first species having a first isotope and a second species having a second isotope, said method comprising:

(a) selectively exciting said first species in preference to said second species;

(b) reacting some of said selectively excited first species with a predetermined radiation so as to promote selective dissociative ionization of said first species resulting in a product, some of said product being a positive ion, said product also including a neutral fragment and an electron;

(c) reacting some other of said selectively excited first species with said product electron so as to promote dissociative electron attachment of said other first species resulting in another product including a negative ion;

(d) reacting said product negative ion with said product positive ion so as to form a product neutral species of differing mass than said first or second species; and

(e) separating said product neutral species from the balance of said mixture.

4,255,405

NAPHTHOQUINONE ANTI-PSORIATIC AGENTS

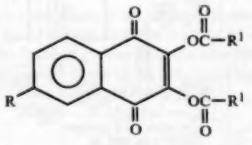
Gordon H. Jones, Cupertino, and John Young, Redwood City, both of Calif., assignors to Syntex (U.S.A.) Inc., Palo Alto, Calif.

Continuation-in-part of Ser. No. 912,697, Jun. 5, 1978. This application May 29, 1979, Ser. No. 43,090

Int. Cl.[3] A61K *31/22*

U.S. Cl. 424—311 **10 Claims**

1. A pharmaceutical composition for relieving a condition of psoriasis in a mammal in a form suitable for topical administration to said mammal which comprises at least one pharmaceutically acceptable, non-toxic excipient and a psoriasis-relieving amount of a compound selected from those represented by the formula



wherein R is hydrogen, halo, cyano or C_1 to C_1salkoxy and R^1 is alkyl of one to five carbon atoms.

4,255,406

TREATMENT OF AMMONIA SYNTHESIS PURGE GAS

Wieslaw H. Isalski, Sale, and Terence R. Tomlinson, Stockport, both of England, assignors to Petrocarbon Developments Limited, Manchester, England

Filed Oct. 10, 1979, Ser. No. 83,952

Claims priority, application United Kingdom, Oct. 10, 1978, 39880/78

Int. Cl.[3] B01D *51/00*; C01C *1/04*

U.S. Cl. 423—359 **13 Claims**

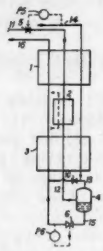
1. A process for the recovery of hydrogen from purge gas comprising hydrogen and nitrogen and impurities including methane and argon from an ammonia synthesis plant which comprises:

(a) cooling a high pressure stream of said purge gas to a sub-ambient temperature at which substantially all of the methane and argon contained in said purge gas stream and a portion of the nitrogen condense,

(b) expanding liquid and vapour components of the cooled high pressure stream to an intermediate pressure,

(c) phase separating liquid and vapour components of the cooled and expanded purge gas stream,

(d) expanding separated liquid component from step (c), and



(e) heating expanded separated liquid component from step (d) and separated vapour component from step (c) in heat exchange with said high pressure stream of purge gas to cool the latter.

4,255,407

METHOD FOR THE REGENERATION OF PICKLING ACKS

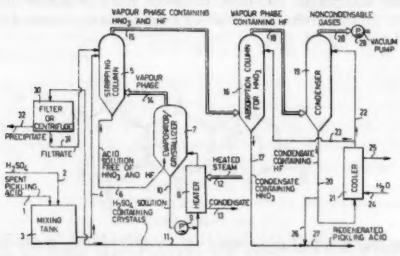
Juhani E. Puurunen, Pori, Finland, assignor to Oy W. Rosenlaw Ab, Pori, Finland

Filed Dec. 7, 1979, Ser. No. 101,184

Claims priority, application Finland, Dec. 7, 1978, 783773

Int. Cl.³ C01B *21/46*

U.S. Cl. 423—390 **4 Claims**



1. A method for the regeneration of spent pickling acids selected from the group consisting of nitric acid, hydrofluoric acid and mixtures thereof, characterized in that

the spent pickling acid is mixed with such a minor quantity of sulphuric acid that the acid removed with the precipitate and any other acid losses are compensated,

the mixture obtained is passed to a stripping column (**5**) in which the mixture comes into contact with steam from an evaporator/crystallizer (**7**) and the filtrate from a filter or centrifuge (**30**); whereby the weaker acids are brought into the vapour phase which is passed to a condenser (**19**),

the liquid phase from the stripping column is passed to said evaporator/crystallizer in which the metals are concentrated and from which the vapour obtained is passed through said stripping column to said condenser,

the condensate (**20**) obtained from said condenser forms the regenerated pickling acid,

the liquid phase from said evaporator/crystallizer is passed to said filter or centrifuge in which the precipitate is separated,

and the filtrate obtained is passed to said stripping column.

4,255,408

PROCESS FOR REMOVING SULFUR AND SULFUR COMPOUNDS FROM THE EFFLUENT OF INDUSTRIAL PROCESSES

Anker V. Sims, Redondo Beach, Calif., assignor to Thermo-Mist Company, Downey, Calif.

Continuation-in-part of Ser. No. 706,005, Jul. 16, 1976, abandoned, which is a continuation of Ser. No. 134,511, Apr. 15, 1971, Pat. No. 3,838,979, which is a continuation-in-part of Ser. No. 778,083, Nov. 22, 1968, abandoned. This application Nov. 11, 1977, Ser. No. 850,612

Int. Cl.³ C01B *17/04*

U.S. Cl. 423—571 R **13 Claims**

1. A process for removing sulfur dioxide from the effluent of an industrial process and for the production of elemental sulfur, the process comprising the steps of:

(a) continuously passing the effluent and hydrogen sulfide into a Claus reactor;

(b) continuously passing a catalyst of the Claus reaction into and through the Claus reactor;

(c) continuously converting a substantial portion of the sulfur dioxide in the effluent to elemental sulfur in the reactor and in the presence of the catalyst by the Claus reaction at a temperature no greater than about 320° F. and at about atmospheric pressure;

(d) continuously depositing the sulfur thus formed on the catalyst;

(e) continuously passing the catalyst and the deposited sulfur from the Claus reactor at about the temperature of reaction in the reactor;

(f) discharging the effluent from the Claus reactor with the substantial portion of the sulfur dioxide removed;

(g) continuously removing the deposited sulfur from the catalyst that has passed from the Claus reactor externally of the Claus reactor by:

(i) passing the catalyst and deposited sulfur that has passed from the Claus reactor into a sulfur condensation zone of a sulfur recovery vessel at about the temperature of reaction in the Claus reactor;

(ii) passing the catalyst and the deposited sulfur from the sulfur condensation zone into a sulfur vaporization zone of the sulfur recovery vessel;

(iii) heating the catalyst and sulfur in the sulfur vaporization zone to vaporize the sulfur;

(iv) passing the vaporized sulfur in a stream of recycle gas into the sulfur condensation zone countercurrent to the catalyst and deposited sulfur;

(v) condensing the vaporized sulfur to a liquid or a solid and cooling the recycle gas in the condensation zone by direct heat transfer with the countercurrent catalyst and deposited sulfur and heating the catalyst and deposited during this heat transfer;

(vi) passing the recycle gas with the condensed sulfur entrained therein from the sulfur condensation zone and the recovery vessel, the temperature of the condensed sulfur and recycle gas passed from the sulfur condensation zone approaching the temperature of the catalyst and deposited sulfur entering the sulfur condensation zone by reason of the heat transfer that takes place in the sulfur condensation zone;

(vii) removing the condensed sulfur from the recycle gas; and

(viii) recycling the recycle gas into the sulfur recovery vessel;

(h) passing the catalyst from the sulfur vaporization zone into a heat recovery zone of the sulfur recovery vessel;

(i) passing the recycle gas into the sulfur recovery vessel through the heat recovery zone and transferring heat from the catalyst to the recycle gas; and

(j) continuously passing the catalyst from the heat recovery zone of the sulfur recovery vessel into the Claus reactor for the conversion of sulfur dioxide to elemental sulfur, the temperature of the catalyst passed from the heat recovery zone approaching the temperature of the recycle

gas passing into the heat recovery zone by reason of the heat transfer that takes place in the heat recovery zone, and the temperature of the recycle gas passing into the heat recovery zone being substantially the same as the temperature of the recycle gas passing from the sulfur condensation zone.

4,255,409

PROCESS FOR PRODUCING ACICULAR GOETHITE

Toshihiro Hamabata, and Shinji Umeki, both of Tokyo, Japan, assignors to TDK Electronics Company Limited, Tokyo, Japan

Filed Dec. 11, 1979, Ser. No. 102,441
Claims priority, application Japan, Dec. 11, 1978, 53-153338
Int. Cl.[3] C01G *49/02*
U.S. Cl. 423—632 **7 Claims**

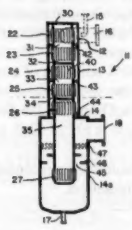
1. A process for producing an acicular goethite comprising:
adjusting the pH of an aqueous solution of a ferrous salt to a value higher than 11;
allowing a precipitate of ferrous hydroxide to form;
adjusting the ratio of the anion of the ferrous salt to the ferrous hydroxide to 0.1 to 0.5 by separating a portion of the supernatant from said precipitate; and
oxidizing the precipitate with an alkali metal chlorate at a temperature lower than 80° C.

4,255,410

CONTACT METHOD FOR MULTIPHASE PROCESSING

Jerome S. Spevack, New Rochelle, N.Y., assignor to Deuterium Corporation, New Rochelle, N.Y.

Division of Ser. No. 655,239, Feb. 4, 1976, Pat. No. 4,062,663. This application Sep. 28, 1977, Ser. No. 837,380
Int. Cl.[2] B01D *47/10*; B01F *3/08, 3/04, 3/12*
U.S. Cl. 423—659 **12 Claims**



1. A method of delivering and processing a plurality of phases at least one of which is a heavier fluid phase and another is a lighter fluid phase by mixing, intimately contacting and applying centrifugal force to said phases, which method comprises:
(a) providing means comprising in combination:
(1) an elongated housing having communicating input, process and output sections connected for passing flows of each of said phases from the input section into the input end of the process section and from the output end of the process section into the output section, having separate inlet means connected to said input section for feeding each of said flows thereinto, and having outlet means connected to said output section for discharging the processed phases therefrom, said process section being (i) in the form of an elongated body having an axis and being (ii) axially positioned with its output end at an elevation no higher than its input end and providing the said flow path which in its axially direction is not counter to the force of gravity, and said output section comprising a circular cross section chamber and means for causing circumferential movement of the flows therein,
(2) multiphase contact means in said housing having a series of mixing elements comprising at least a first mixing element and a second mixing element, each of said elements having a cylindrical chamber which is closed at one end and open at the other end, each pair of said first and second elements being joined together at their open ends, the cylindrical sides of each of said chambers having openings therein for the passage of said flows cocurrently therethrough, said openings being provided with flow guide means extending from said sides for directing the said flows in the same circumferential direction in one radial direction to the axis of each first mixing element and in the opposite radial direction to the axis of the second mixing element, said mixing elements being in axial alignment, with the closed end of the second mixing element of a pair of elements positioned opposite to the closed end of the next following first mixing element, and disposed coaxially in said process section except for the first of said series of mixing elements which is disposed in said input section, and for the last of said series of mixing elements which is disposed in said output section, and
(3) partitions extending between said housng and each first mixing element, intermediate and side openings and open end thereof, forming a conduit for passing at least a principal part of the said flows from the inlet of said input section to said process section and therethrough generally not counter to the force of gravity and therefrom to the outlet of said output section through each of said mixing elements in sequence,
(b) delivering flows of each of said phases to the first of said series of mixing elements,
(c) passing cocurrent flows of said phases in a circumferential motion through said series of mixing elements and in an axial direction therethrough not counter to the force of gravity,
(d) intimately contacting said phases by passing said cocurrent flows first in one radial direction through the flow guiding openings in the side of one of said mixing elements and then in said opposite radial direction through the flow guiding openings in the side of the next of said mixing elements of said series, while passing said flows in said axial direction not counter to the force of gravity, and
(e) discharging said cocurrent flows of lighter and heavier phases from the last of said series of mixing elements; whereby
(f) said flow of lighter phase is not required to elevate a heavier phase and expend energy to move it in the upward direction counter to the force of gravity, and the maximum quantity of such flow of heavier phase being processed is not limited by the velocity of the lighter phase flow.

4,255,411

PROCESS OF DETERMINING AN IMMUNOGENIC SUBSTANCE BY COMPETITION WITH AN ANTIBODY IN A MICROCAPSULE

Franklin Lim, Richmond, and Richard D. Moss, Chester, both of Va., assignors to Damon Corporation, Needham Heights, Mass.

Continuation-in-part of Ser. No. 606,166, Aug. 20, 1975. This application Nov. 27, 1978, Ser. No. 963,932
Int. Cl.[3] A61K *43/00*; G01N *33/48*; G01T *1/00*; B01J *13/00*
U.S. Cl. 424—1 **8 Claims**

1. A process for measuring the concentration of an immunogenic substance in a sample, said process comprising the steps of:
a. providing a microcapsule containing antibody to said substance, said microcapsule having walls of a permeability insufficient to allow traverse of said antibody but sufficient to allow passage of said substance and a distinguishable analog thereof;
b. allowing the substance and a distinguishable analog thereof to traverse said semipermeable microcapsule wall to competitively bind onto the antibody contained within the semipermeable microcapsule;
c. determining the relative binding of said substance and said distinguishable analog; and
d. calculating from the determination of step c the amount of

substance per unit volume of said sample by reference to a standard.

4,255,412

T_3 UPTAKE TEST EMPLOYING A PRECIPITATED NYLON SEPARATING AGENT

Anthony H. Albert, Villa Park, Calif., assignor to Beckman Instruments, Inc., Fullerton, Calif.

Filed Dec. 19, 1978, Ser. No. 970,848

Int. Cl.³ G01N *33/48;* A61K *43/00;* G01N *23/06*

U.S. Cl. 424—1 **12 Claims**

1. An improved T_3 uptake test procedure of the type wherein:

(a) a solution is contacted with labeled T_3 and a separating agent;

(b) serum bound labeled T_3 and separating agent bound labeled T_3 are separated into two fractions;

(c) at least one of said fractions is measured; wherein the improvement comprises contacting said solution with a separating agent selected from a group consisting of precipitated nylon 6, precipitated nylon 66, and mixtures thereof.

4,255,413

GELATIN CAPSULE DOSAGE UNIT CONTAINING TRIAMTERENE

Elisabeth S. Rattie, Abington, and Louis J. Ravin, Plymouth Meeting, both of Pa., assignors to SmithKline Corporation, Philadelphia, Pa.

Filed Oct. 1, 1979, Ser. No. 80,592

Int. Cl.³ A61K *9/48, 31/505, 31/54*

U.S. Cl. 424—37 **7 Claims**

1. A gelatin capsule dosage unit comprising triamterene, and a rapid dissolution and dispersing amount of a combination of a surfactant and a calcium, ammonium, or alkali metal nontoxic carbonate or bicarbonate salt.

5. A gelatin capsule dosage unit comprising triamterene, hydrochlorothiazide, and a rapid dissolution and dispersing amount of a combination of a surfactant, and a calcium, ammonium, or alkali metal nontoxic carbonate or bicarbonate salt.

4,255,414

EDIBLE OR ORAL COMPOSITIONS

Andreas Lembke, Eutin-Sielbeck, and Dietrich Gorny, Frankfurt am Main, both of Fed. Rep. of Germany, assignors to Ferrero GmbH, Frankfurt am Main, Fed. Rep. of Germany

Filed Jan. 24, 1979, Ser. No. 6,305

Claims priority, application Fed. Rep. of Germany, Jan. 31, 1978, 2804093

Int. Cl.³ A61K *7/28, 37/48*

U.S. Cl. 424—50 **45 Claims**

1. An edible or oral low moisture content composition which composition contains sugar, sugar substitutes or no sugar and a content of the enzymes lactate dehydrogenase and sucrose-inverting enzyme sufficient to limit promotion of tooth decay.

4,255,415

POLYVINYL ALCOHOL OPHTHALMIC GEL

Sukhbir S. Chrai, Belleville; Santosh Gupta, Bloomfield, and Michael J. Hensley, Dover, all of N.J., assignors to Schering Corporation, Kenilworth, N.J.

Continuation of Ser. No. 816,783, Jul. 18, 1977, abandoned. This application Nov. 22, 1978, Ser. No. 962,812

Int. Cl.³ A61K *31/74, 31/59, 31/35, 31/415*

U.S. Cl. 424—78 **19 Claims**

1. A topical ophthalmic gel comprising:

0.05–10% by weight of an ophthalmic medicament;

1–3% by weight of a polyvinyl alcohol of the grades 20–100, with a molecular weight of over 10,000, and a viscosity rating of 5–65;

0.1–1% by weight of a borate gelling agent, said borate gelling agent being an alkali metal or alkaline-earth borate salt or being generated in situ by the reaction of boric acid with aqueous alkali; and

85–99% sterile water; said gel being maintained at a pH of 6.5–8.5.

4,255,416

SKIN FIRMING COMPOSITION AND METHOD

Sally I. Gillespie, 233 N. Causeway, New Smyrna Beach, Fla. 32069

Continuation-in-part of Ser. No. 22,846, Mar. 22, 1979, abandoned. This application Aug. 16, 1979, Ser. No. 67,140

Int. Cl.³ A61K *7/02, 7/021*

U.S. Cl. 424—80 **13 Claims**

1. A composition adapted for temporarily firming human skin consisting essentially of:

(1) 7.5 to 15% of an alkali metal salt of polystyrene sulfonate having a molecular weight of from about 10,000 to about 250,000;

(2) 0.1 to 8% of a second water soluble polymer selected from the group consisting of polyvinylpyrrolidone, vinyl pyrrolidone-vinyl acetate copolymers, vinylpyrrolidone/dimethylaminoethylmethacrylate copolymers and mixtures thereof;

(3) 0.3 to 1.0% of a 40% solution of a sodium silicate/sodium oxide mixture, in the weight ratio of 2.4 consisting of, by weight, 13.85% Na_2O and 33.2% SiO_2 having a density at 68° F. of Baume 52.0° a pH of 12.0, and a viscosity of 2,100 centipoises; and

(4) the remainder, water, said percentages being based on the weight of the composition.

4,255,417

PLATINUM COMPOUNDS FOR THE IRRADICATION OF SKIN BLEMISHES

John D. Bohm, Cherry Hill, N.J., and James B. Hunter, Newtown Square, Pa., assignors to Johnson Matthey, Inc., Malvern, Pa.

Filed Aug. 4, 1976, Ser. No. 711,640

Int. Cl.³ A61K *33/24, 31/28*

U.S. Cl. 424—131 **1 Claim**

1. A method of eliminating warts and moles on the skin of a human which comprises topically applying to said wart or mole an effective amount of cis platinum diamino dichloride.

4,255,418

ANTI-ACNE LOTION

Florence H. Bailey, 201 W. Illinois Ave., Greensburg, Kans. 67054

Filed May 14, 1979, Ser. No. 38,651

Int. Cl.³ A61K *33/30, 35/78*

U.S. Cl. 424—145 **9 Claims**

1. A method of manufacturing an anti-acne lotion comprising:

(a) grinding a plurality of cucumbers in a grinding zone to extract from said cucumbers between about 86% wt and 97% wt of cucumber juice;

(b) heating said cucumber juice of step (a) to 212° F.;
(c) cooling subsequently said heated juice of step (b) to between about 90° F. and 140° F.;
(d) mixing each of the following compounds with each other: between about 0.34% wt and 1.02% wt of zinc oxide; between about 0.04% wt and 0.12% wt of a $Na_2B_4O_7 \cdot nH_2O$ wherein n is selected from the group consisting of 0, 5, and 10; between about 1.08% wt and 3.23% wt of vinegar; between about 0.68% wt and 2.03% wt of a compound selected from the group consisting of hydroxybenzenes, dihydroxybenzenes, pyrogallol, phloroglucinol, methylpyrogallol, tetrahydroxybenzene, pentahydroxybenzene, hexahydroxybenzene, and mixtures thereof;
(e) heating said mixture of step (d) to between about 90° F. and 140° F.;
(f) admixing the heated mixture of step (e) with the cooled cucumber juice of step (c);
(g) mixing between about 2.15% wt and 6.44% wt of an oil selected from the group consisting of paraffin oil, almond oil, mineral oil, and mixtures thereof; and between about 0.68% wt and 2.03% wt of castor oil, with each other;
(h) heating said mixture of step (g) to between about 90° F. and 140° F.; and
(i) combining said mixture of step (f) with the mixture of step (h), at a temperature of between about 90° F. and 140° F., continually stirring while combining.

4. An anti-acne lotion prepared by the method of claim 1.

4,255,419

ZINC DEFICIENCY IN MULTIPLE SCLEROSIS

Irving H. Leopold, Newport Beach, Calif., assignor to Allergan Pharmaceuticals, Inc., Irvine, Calif.

Filed Sep. 27, 1979, Ser. No. 79,266
Int. Cl.³ A61K *33/30*
U.S. Cl. 424—145 **6 Claims**

1. A method of treating multiple sclerosis in a human having multiple sclerosis and having lower than normal concentrations of serum zinc comprising elevating the serum zinc level in said human.

4,255,420

HORMONE COMBINATION AND METHOD FOR STIMULATION OF OVULATION

Jost Bergfeld, Dummerstorf; Marie-Luise Raasch, Rostock; Ingo König, Dummerstorf, and Klaus-Peter Brüssow, Rostock, all of German Democratic Rep., assignors to VEB Berlin-Chemie, Berlin, German Democratic Rep.

Filed Jan. 4, 1980, Ser. No. 109,688
Claims priority, application German Democratic Rep., Dec. 29, 1978, 210247
Int. Cl.³ A61K *37/00*
U.S. Cl. 424—177 **3 Claims**

1. A hormone combination for stimulation of ovulation in female animals, comprising HCG in IE units and Gn—RH in μg in a ratio of 10:1 to 1:10.

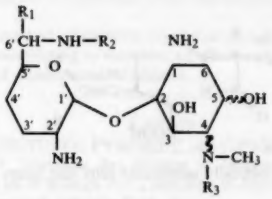
4,255,421

FORTIMICIN AMINOGLYCOSIDES, PROCESS FOR PRODUCTION THEREOF, AND USE THEREOF

Isamu Watanabe; Akio Iwasaki, and Toshihito Mori, all of Higashimurayama, Japan, assignors to Kowa Company, Ltd., Nagoya, Japan

Filed Oct. 12, 1979, Ser. No. 85,058
Claims priority, application Japan, Oct. 18, 1978, 53/127388; Jun. 20, 1979, 54/76768
Int. Cl.³ A61K *31/71*; C07H *15/22*
U.S. Cl. 424—180 **5 Claims**

2. An antibiotic composition which comprises
(i) an antibiotically effective amount of a compound having the following formula



(I)-1

wherein R_1 and R_2 are identical or different, and each represents a hydrogen atom or a methyl group, and R_3 represents a hydrogen atom or an unsubstituted or substituted aminoacyl group having 2 to 4 carbon atoms in the acyl moiety, the substituent being selected from the group consisting of hydroxy, formyl, and carbamoyl, and when all of R_1, R_2 and R_3 are hydrogen atoms, the methylamino group at the 4-position is not oriented trans to the hydroxyl groups at the 3- and 5-positions, or a pharmaceutically acceptable acid addition salt thereof, and
(ii) a pharmaceutically acceptable diluent or carrier.

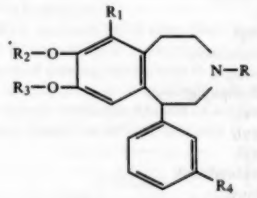
4,255,422

6-HALO-7,8-DIHYDROXY-1-PHENYL-2,3,4,5-TETRAHYDRO-1H-3-BENZAZEPINES

Joseph Weinstock, Phoenixville, Pa., assignor to SmithKline Corporation, Philadelphia, Pa.

Continuation-in-part of Ser. No. 742,965, Nov. 17, 1976, Pat. No. 4,160,765. This application Apr. 4, 1978, Ser. No. 893,238
Claims priority, application South Africa, Oct. 4, 1977, 77/5910
Int. Cl.³ A61K *31/55*; C07D *223/16*
U.S. Cl. 424—244 **11 Claims**

1. A compound of the formula:



in which:
R is hydrogen;
R_1 is halo or trifluoromethyl;
R_2 and R_3 are hydrogen or lower alkanoyl of from 2–7 carbons; and
R_4 is hydrogen, trifluoromethyl, halo, methyl or methoxy; together with its nontoxic, pharmaceutically acceptable salts.

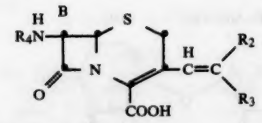
4,255,423

CEPHALOSPORIN COMPOUNDS

Thomas R. Beattie, North Plainfield; John Hannah, Matawan, and David B. R. Johnston, Warren, all of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Continuation of Ser. No. 624,623, Oct. 22, 1975, abandoned, which is a continuation of Ser. No. 367,291, Jun. 5, 1973, abandoned. This application Jul. 27, 1977, Ser. No. 819,511
Int. Cl.³ C07D *501/20*
U.S. Cl. 424—246 **8 Claims**

1. Compounds of the formula:



and the pharmaceutically acceptable salts and esters thereof; wherein

R_4 is an acyl group selected from the group consisting of:
phenacetyl,
3-bromophenylacetyl,
p-aminomethylphenylacetyl,
4-carboxylmethylphenylacetyl,
4-carboxamidomethylphenylacetyl,
2furylacetyl,
5-nitrofurylacetyl,
3-furylacetyl,
2-thienylacetyl,
5-chlorothienylacetyl,
5-methoxythienylacetyl,
α-guanidino-2-thienylacetyl,
3-thienylacetyl,
4-methylthienylacetyl,
3-isothiazolylacetyl,
4-methoxyisothiazolylacetyl,
4-isothiazolylacetyl,
3-methylisothiazolylacetyl,
5-isothiazolylacetyl,
3-chloroisothiazolylacetyl,
3-methyl-1,2,5-oxadiazolylacetyl,
1,2,5-thiadiazolyl-4-acetyl,
3-methyl-1,2,5-thiadiazolyl-4-acetyl, p1 3-chloro-1,2,5-thiadiazolyl-4-acetyl,
3-methoxy-1,2,5-thiadiazolyl-4-acetyl,
phenylthioacetyl,
4-pyridylthioacetyl,
cyanoacetyl,
tetrazolylacetyl,
α-fluorophenylacetyl,
D-phenylglycyl,
4-hydroxy-D-phenylglycyl,
2-thienylglycyl,
3-thienylglycyl,
phenylmalonyl,
3-chlorophenylmalonyl,
2-thienylmalonyl,
3-thienylmalonyl,
α-phosphonophenylacetyl,
α-sulfaminophenylacetyl,
α-hydroxyphenylacetyl,
α-tetrazolylphenylacetyl, and
α-sulfophenylacetyl;

B is hydrogen or methoxy

wherein when B is methoxy:

R_2 and R_3 may be the same or different and are each selected from the following:

(a) hydrogen;

(b) substituted and unsubstituted: lower alkyl of 1–6 carbon atoms; wherein the substituents are selected from halo, hydroxyl, NH_2, and NO_2; and wherein when B is hydrogen:

R_2 and R_3 may be the same or different and are each selected from the following:

(a) hydrogen with the proviso that both R_2 and R_3 may not be hydrogen;

(b) alkanoyloxyalkyl wherein the alkanoyl moiety has 1–6 carbon atoms and the alkyl portion has 1–6 carbon atoms.

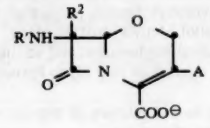
4,255,424

7-N-HETEROCYCLYL 1-OXA, 1-AZA, AND 1-CARBADETHIACEPHALOSPORINS

John Hannah, Matawan, N.J., assignor to Merck & Co., Inc., Rahway, N.J.

Filed Apr. 27, 1979, Ser. No. 34,051
Int. Cl.³ A61K *31/44*; C07D *211/28*
U.S. Cl. 424—248.51 **5 Claims**

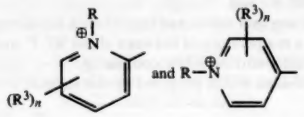
1. A compound having the structural formula:



and the pharmaceutically acceptable salts and esters thereof wherein:

R^2 is hydrogen or methoxyl;

R′ is selected from the group consisting of:

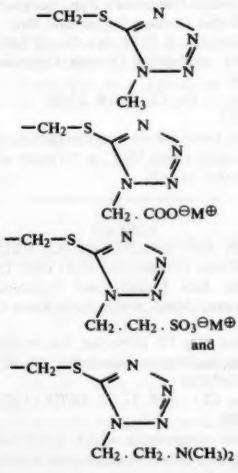


R is hydrogen alkyl having from 1–6 carbon atoms; substituted alkyl having from 1–6 carbon atoms wherein the substituent is chloro, fluoro, hydroxyl, alkoxyl (C_{1-6}), carboxyl, amino, sulfo and mono- and dialkylamino wherein each alkyl has 1–6 carbon atoms substituted and unsubstituted: phenylalkyl and phenylalkenyl having 7–12 carbon atoms wherein the substituent is selected from chloro, fluoro, carboxyl, amino, cyano, hydroxyl and sulfo;

R^3 is chloro, fluoro, hydroxyl, carboxyl, sulfo, cyano, amino, mono- and dialkylamino, alkoxyl, alkyl having from 1–6 carbon atoms, substituted alkyl having 1–6 carbon atoms wherein the substituent is carboxyl, cyano, alkoxyl having 1–6 carbon atoms, phenyl and phenyloxy;

n is an integer selected from 0 to 3; and

A is selected from:



wherein M is a pharmaceutically acceptable cation.

5. An antibiotic pharmaceutical composition comprising a therapeutically effective amount of a compound according to claim 1 and a pharmaceutical carrier therefor.

4,255,425
SULPHOXIDES

George R. White, Harpenden, England, assignor to Smith Kline & French Laboratories Limited, Welwyn Garden City, England

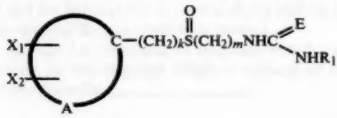
Division of Ser. No. 824,121, Aug. 12, 1977, Pat. No. 4,140,783, which is a division of Ser. No. 689,013, May 24, 1976, Pat. No. 4,056,620, which is a division of Ser. No. 627,418, Oct. 30, 1975, Pat. No. 3,979,398, which is a division of Ser. No. 436,285, Jan. 24, 1974, Pat. No. 3,932,443. This application Nov. 13, 1978, Ser. No. 960,364

Claims priority, application United Kingdom, Feb. 8, 1973, 6153/73; Oct. 23, 1973, 49257/73

Int. Cl.[3] C07D *237/04, 239/38, 241/14, 31/505*

U.S. Cl. 424—250 7 Claims

1. A compound of the formula:



wherein A is such that the heterocyclic nucleus formed is a pyrimidine, pyrazine or pyridazine ring; X_1 and X_2, which may be the same or different are hydrogen, lower alkyl, trifluoromethyl, hydroxyl, halogen or amino; k is 0 to 2 and m is 2 or 3 provided that the sum of k and m is 3 or 4; E is oxygen, sulphur or NR_2; R_1 is hydrogen, lower alkyl, benzoyl or dimethylaminoethyl; and R_2 is hydrogen, nitro, cyano, alkanesulphonyl having 1 to 3 carbon atoms, benzenesulphonyl, halobenzenesulphonyl or toluenesulphonyl.

7. A pharmaceutical composition to inhibit histamine H-2 receptors comprising in an amount effective to inhibit said receptors a compound of claim 1 together with a pharmaceutically acceptable diluent or carrier.

4,255,426
1-(2-HYDROXY-3-N-ALKOXYPROPYL)-4-SUBSTITUTED-PIPERAZINES AND PIPERIDINES

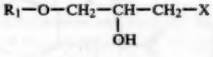
Allen R. Kraska, East Lyme, Conn., assignor to Pfizer Inc., New York, N.Y.

Filed Jul. 9, 1979, Ser. No. 55,936

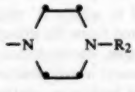
Int. Cl.[3] A61K *31/495;* C07D *295/08*

U.S. Cl. 424—250 21 Claims

1. A compound of the formula



and the pharmaceutically acceptable acid addition salts thereof, wherein R_1 is n-alkyl of 10 to 20 carbon atoms; and X is



wherein R_2 is selected from the group consisting of hydrogen, alkyl of 1 to 3 carbon atoms, benzyl, monosubstituted benzyl, phenyl and monosubstituted phenyl, wherein said substituents are selected from the group consisting of chloro, bromo, fluoro, alkyl of 1 to 3 carbon atoms and alkoxy of 1 to 3 carbon atoms.

18. A method of immune regulation in a host which comprises administering to said host an effective immune regulant amount of a compound of claim 1.

4,255,427
SUBSTITUTED PYRIMIDO (4,5-C)PYRIDAZINES

Robert W. Morrison, Jr.; William R. Mallory, and Virgil L. Styles, all of Raleigh, N.C., assignors to Burroughs Wellcome Co., Research Triangle Park, N.C.

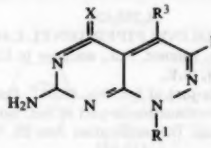
Filed Jul. 7, 1978, Ser. No. 922,544

Claims priority, application United Kingdom, Jul. 8, 1977, 28764/77

Int. Cl.[3] C07D *487/04;* A61K *31/50, 31/505*

U.S. Cl. 424—251 20 Claims

1. A compound of the formula (I)



or a tautomer or a non-toxic salt thereof acceptable to animals, wherein R^1 is benzyl, or lower alkyl optionally substituted by hydroxy; R^2 is hydrogen, hydroxy, methyl, hydroxymethyl, benzyl optionally substituted in the phenyl ring with nitro or one or two lower alkoxy, phenacyl optionally substituted in the phenyl ring with hydroxy or lower alkoxy, $—CH(Y)CO_2Z$ in which Y is hydrogen, lower alkyl, or benzyl, and Z is hydrogen or lower alkyl; R^3 is hydroxy, methyl, or phenyl optionally substituted with hydroxy; and X is oxygen or NH: provided that:

(i) R^3 is methyl only when R^2 is methyl or hydroxy;

(ii) R^3 is phenyl optionally substituted with hydroxy only when R^2 is hydrogen;

(iii) when R^3 is hydroxy, R^2 is other than hydrogen; and

(iv) R^2 and R^3 are not both hydroxy.

20. A method of treating coccidiosis in poultry which comprises orally administering to coccidiosis infected poultry an effective coccidiosis treatment amount of the compound, or a tautomer or salt thereof as defined in claim 1.

4,255,428
5-(HYDROXYPYRIDYLALKYL)-4-PYRIMIDONES

Thomas H. Brown; Graham J. Durant, both of Welwyn Garden City, and Charon R. Ganellin, Welwyn, all of England, assignors to Smith Kline & French Laboratories Limited, Welwyn Garden City, England

Filed Apr. 24, 1979, Ser. No. 32,979

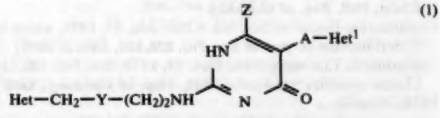
Claims priority, application United Kingdom, Mar. 24, 1979, 10424/79

The portion of the term of this patent subsequent to May 15, 1996, has been disclaimed.

Int. Cl.[3] A61K *31/505;* C07D *401/14, 417/14*

U.S. Cl. 424—251 13 Claims

1. A pyrimidone of Structure (1):



(1)

in which Het is a 2- or 4-imidazolyl group optionally substituted by lower alkyl, halogen, trifluoromethyl or hydroxy-

methyl, a 2-pyridyl group optionally substituted by one or more lower alkyl, lower alkoxy, halogen, amino or hydroxy groups, a 2-thiazolyl group, a 3-isothiazolyl group optionally substituted by chlorine or bromine, a 3-(1,2,5)-thiadiazolyl group optionally substituted by chlorine or bromine, or a 2-(5-amino-1,3,4-thiadiazolyl) group; Y is sulphur or methylene; Z is hydrogen or lower alkyl; A is C_1–C_5 alkylene; and Het^1 is 4-hydroxy-2-pyridyl, 6-hydroxy-3-pyridyl, 2-hydroxy-4-pyridyl, 4-hydroxy-5-methyl-2-pyridyl, 6-hydroxy-5-methyl-3-pyridyl, 2-hydroxy-6-methyl-4-pyridyl or 6-hydroxy-5-methoxy-3-pyridyl, in the form of the free base or a pharmaceutically acceptable acid addition salt thereof.

11. A pharmaceutical composition characterised in that it comprises a compound according to claim **1** and a pharmaceutically-acceptable carrier or diluent.

4,255,429

N-QUINAZOLINYLPIPERIDINYL-LACTAMS

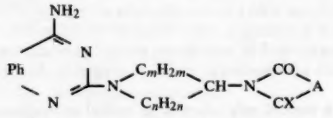
Lincoln H. Werner, Summit, N.J., assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation-in-part of Ser. No. 46,062, Jun. 6, 1979, abandoned, and a continuation-in-part of Ser. No. 944,057, Sep. 20, 1978, abandoned. This application Jan. 28, 1980, Ser. No. 115,634

Int. Cl.[3] **A61K** *31/505;* **C07D** *401/14*

U.S. Cl. 424—251 **10 Claims**

1. An N-[1-(4-amino-2-quinazolinyl)-3 or 4-piperdinyllactam of the formula



wherein Ph is 1,2-phenylene, unsubstituted or substituted by up to 3 lower alkyl or lower alkoxy groups, or by one lower alkylenedioxy group; each of m and n is an integer from 1 to 3, but m+n=4; X represents 2 hydrogen atoms or oxo and A is lower alkylene, 4 to 7 ring-membered cycloalkylene, cycloalkyl-lower alkylene, spirocycloalkane-lower alkylene, H-Ph-lower alkylene or Ph; or a pharmaceutically acceptable acid addition salt thereof.

9. An antihypertensive pharmaceutical composition comprising a hypotensively effective amount of a compound as claimed in claim **1**, together with a pharmaceutical excipient.

4,255,430

1-ARYLOXY-2-HYDROXY-3-[(TETRAHYDROQUINOLONYLALKYL)-AMINO]-PROPANES AND SALTS THEREOF

Herbert Köppe, Ingelheim am Rhein; Anton Mentrup, Mainz-Kastel; Ernst-Otto Renth; Kurt Schromm, both of Ingelheim am Rhein; Wolfgang Hoefke, Budenheim, and Gojko Muacevic, Ingelheim am Rhein, all of Fed. Rep. of Germany, assignors to Boehringer Ingelheim GmbH, Ingelheim am Rhein, Fed. Rep. of Germany

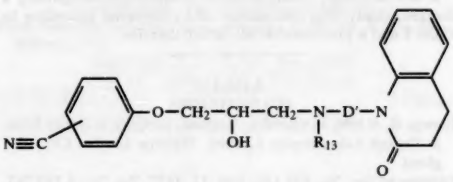
Continuation-in-part of Ser. No. 4,280, Jan. 17, 1979, which is a continuation-in-part of Ser. No. 838,450, Oct. 3, 1977, abandoned. This application Dec. 14, 1979, Ser. No. 103,724

Claims priority, application Fed. Rep. of Germany, Oct. 5, 1976, 2644833

Int. Cl.[3] **A61K** *31/47;* **C07D** *215/22*

U.S. Cl. 424—258 **3 Claims**

1. A compound of the formula



wherein

R_{13} is hydrogen or methyl; and

D' is alkylene of 2 to 8 carbon atoms,

or a non-toxic, pharmacologically acceptable acid addition salt thereof.

3. The method of blocking the α- and β-adrenergic receptors in a warm-blooded animal in need thereof, which comprises perorally, parenterally or rectally administering to said animal an effective amount of a compound of claim **1**.

4,255,431

GASTRIC ACID SECRETION INHIBITING SUBSTITUTED 2-(2-BENZIMIDAZOLYL)-PYRIDINES, PHARMACEUTICAL PREPARATIONS CONTAINING SAME, AND METHOD FOR INHIBITING GASTRIC ACID SECRETION

Ulf K. Junggren, Mölnlycke, and Sven E. Sjöstrand, Kungsbacka, both of Sweden, assignors to Aktiebolaget Hassle, Mölndal, Sweden

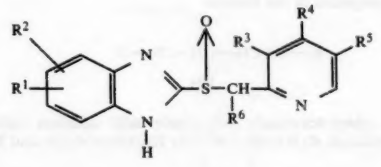
Filed Apr. 5, 1979, Ser. No. 27,277

Claims priority, application Sweden, Apr. 14, 1978, 7804231

Int. Cl.[3] **A61K** *31/44;* **C07D** *401/12*

U.S. Cl. 424—263 **29 Claims**

1. A method of inhibiting gastric acid secretion by administering to mammals, including man, suffering from gastric acid secretion disturbances a compound of the formula III



(III)

or a pharmaceutically acceptable salt thereof in a therapeutically effective amount in which R^1 and R^2 are the same or different and are selected from the group consisting of hydrogen, lower alkyl, halogen, carbomethoxy, carbethoxy, lower alkoxy, and lower alkanoyl in any position, R^6 is selected from the group consisting of hydrogen, methyl, and ethyl, R^3, and R^5 are the same or different and are each selected from the group consisting of hydrogen, methyl, methoxy, ethoxy, methoxyethoxy, and ethoxyethoxy; and R^4 is methoxy, ethoxy, methoxyethoxy and ethoxyethoxy.

4,255,432
8-[2-3-INDOLYL)ETHYL]-1-OXA-3-,8-DIAZAS-PIRO[4.5]DECAN-2-ONES, PHARMACEUTICAL COMPOSITIONS THEREOF AND METHODS OF USE THEREOF

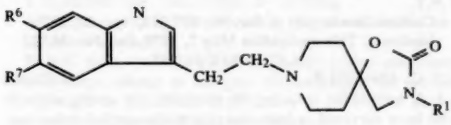
Arthur F. Kluge, Los Altos; Arthur M. Strosberg, Portola Valley, and Stefan H. Unger, Palo Alto, all of Calif., assignors to Syntex (U.S.A.) Inc., Palo Alto, Calif.

Continuation of Ser. No. 9,205, Feb. 5, 1979, abandoned. This application Sep. 6, 1979, Ser. No. 72,867

Int. Cl.[3] **A61K** *31/435;* **C07D** *521/00;* **C01D** *498/10*

U.S. Cl. 424—267 **11 Claims**

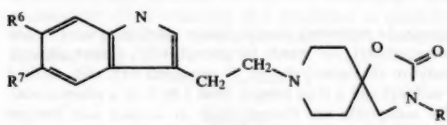
1. A compound chosen from those represented by the formula



I

wherein R^1 is C_1 to C_6 alkyl and R^6 and R^7 are the same or different and are hydrogen or C_1 to C_6 alkoxy and the pharmaceutically acceptable, non-toxic salts thereof.

10. A method for treatment of migraine which comprises administering an anti-migraine effective amount of the compound of the formula:



I

wherein R^1 is C_1 to C_6 alkyl and R^6 and R^7 are the same or different and are hydrogen or C_1 to C_6 alkoxy and the pharmaceutically acceptable, non-toxic salts thereof.

4,255,433
(+)-(3-METHYL-4-OXO-5N-PIPERIDINOTHIAZOLIDIN-2-YLIDENE)ACETIC ACID ESTERS, METHOD OF PREPARATION AND USE

Wolfgang Herrmann, Merzhausen; Gerhard Satzinger, Denzlingen; Manfred Herrmann, St. Peter; Wolfgang Steinbrecher, Gundelfingen, and Heinrich Bahrmann, Kirchzarten, all of Fed. Rep. of Germany, assignors to Godecke Aktiengesellschaft, Freiburg, Fed. Rep. of Germany

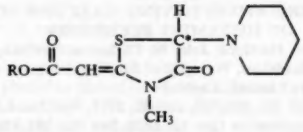
Filed Mar. 21, 1980, Ser. No. 132,577

Claims priority, application Fed. Rep. of Germany, Mar. 22, 1979, 2911296; Dec. 29, 1979, 2952704

Int. Cl.[3] **A61K** *31/445;* **C07D** *417/04*

U.S. Cl. 424—267 **14 Claims**

1. A dextrorotatory isomer, substantially free from the levorotatory isomer, of an optically-active compound of the formula I:



I

in which R is a straight- or branched-chain alkyl group containing from 1 to 4 carbon atoms and *C denotes an asymmetric carbon atom.

13. A pharmaceutical composition comprising an antihypertensive effective amount of a dextrorotatory isomer according to claim **1**, together with a suitable pharmaceutical carrier.

4,255,434
COMBATTING FUNGI WITH 1-(AZOL-1-yl)-4-HALO-(1)-PHENOXY-BUTAN-2-ONES AND -OLS

Wolfgang Krämer; Karl Büchel, both of Wuppertal; Paul-Ernst Frohberger, Leverkusen; Wilhelm Brandes, Cologne, and Hans Scheinpflug, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

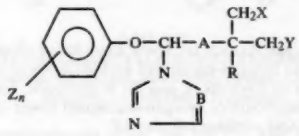
Continuation-in-part of Ser. No. 816,975, Jul. 19, 1977, abandoned. This application Nov. 27, 1978, Ser. No. 964,215

Claims priority, application Fed. Rep. of Germany, Jul. 20, 1976, 2632602; Jul. 20, 1976, 2632603

Int. Cl.[3] **A01N** *43/50, 43/48;* **C07D** *233/60, 249/08*

U.S. Cl. 424—269 **10 Claims**

1. 1-(azol-1-yl)-4-halo-1-phenoxy-butan-2-ones and -ols of the formula



in which

R represents alkyl with 1 to 4 carbon atoms;

X represents hydrogen, alkyl with 1 to 4 carbon atoms or halogen;

Y represents halogen;

Z represents halogen, straight-chain or branched alkyl with 1 to 4 carbon atoms, cycloalkyl with 5 to 7 carbon atoms, halogenoalkyl with 1 or 2 carbon atoms and 1 to 5 halogen atoms, alkoxy with one or 2 carbon atoms, alkylthio with 1 to 2 carbon atoms, alkoxycarbonyl with 1 to 5 carbon atoms in the alkoxy part, amino, cyano, nitro, phenyl or phenoxy substituted with at least one of halogen, amino, cyano, nitro and alkyl with 1 to 2 carbon atoms, phenylalkyl with 1 or 2 carbon atoms on the alkyl part optionally substituted in the alkyl part by alkylcarbonyl with a total of up to 3 carbon atoms and in the phenyl part by halogen, nitro or cyano;

n represents 0,1,2 or 3,

A is —CO— or CH(OH)—, and

B is —N= or —CH=,

or an acid-addition salt thereof.

6. A fungicidal composition containing as active ingredient a fungicidally effective amount of a compound according to claim **1** in admixture with a diluent.

4,255,435
TRIAZOLE COMPOUNDS

Thomas I. Watkins, West Bridgford, and David M. Weighton, Radcliff-on-Trent, both of England, assignors to The Boots Company Limited, Nottingham, England

Continuation-in-part of Ser. No. 840,434, Oct. 7, 1975, abandoned, which is a continuation-in-part of Ser. No. 594,372, Jul. 8, 1975, Pat. No. 4,054,664. This application Jan. 4, 1980, Ser. No. 109,697

Int. Cl.[3] **A01N** *47/38;* **C07D** *249/12*

U.S. Cl. 424—269 **6 Claims**

1. The insecticidally active compound 1(2)-N,N-dimethylcarbamoyl-3-t-butyl-5-but-2-enylthio-1,2,4-triazole.

2. An insecticidal composition comprising an insecticidally effective amount of a compound as defined in claim **1** and an inert diluent.

4. A method of combating insects which comprises applying

an insecticidally effective amount of a compound as defined in claim 1 to the locus of the insects.

4,255,436

2-OXO-3 THIAZOLINE-OXIMES AS PESTICIDES

Paul Winternitz, Greifensee, Switzerland, assignor to Hoffmann-La Roche Inc., Nutley, N.J.

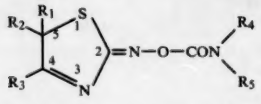
Filed Oct. 31, 1979, Ser. No. 89,793

Claims priority, application Switzerland, Nov. 9, 1978, 11531/78; Aug. 24, 1979, 7728/79

Int. Cl.³ A01N *43/78;* **C07D** *277/04*

U.S. Cl. 424—270 **33 Claims**

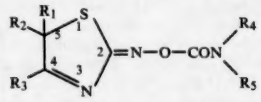
1. A pesticidal composition which comprises inert carrier material and, as the active ingredient, an amount which is effective as a pesticide of at least one compound of the formula



wherein R_1 and R_3 each are lower alkyl, lower alkenyl, cycloalkyl, aryl or halogen-substituted aryl; R_2 is lower alkyl; R_4 is lower alkyl or cycloalkyl; and R_5 is hydrogen, lower alkyl, lower alkylcarbonyl or halogen-substituted lower alkylcarbonyl and an acid addition salt thereof.

5. A method for the control of pests which comprises applying, to the site to be so treated, an amount of the pesticidal composition of claim 1 which is effective in the control of pests.

9. A compound of the formula



wherein R_1 and R_3 each are lower alkyl, lower alkenyl, cycloalkyl, aryl or halogen-substituted aryl; R_2 is lower alkyl; R_4 is lower alkyl or cycloalkyl; and R_5 is hydrogen, lower alkyl, lower alkylcarbonyl or halogen-substituted lower alkylcarbonyl and acid addition salts thereof.

4,255,437

COMBATING FUNGI WITH 2-ARYL-5-ALKYL-3,4-DIOXO-1,2,5-THIAZOLIDINE-1-OXIDES

Hans-Joachim Knops, Wuppertal; Wilhelm Brandes, Leichlingen, and Volker Paül, Solingen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

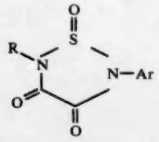
Filed Nov. 19, 1979, Ser. No. 95,716

Claims priority, application Fed. Rep. of Germany, Dec. 7, 1978, 2852869

Int. Cl.³ A01N *43/82;* **C07D** *285/10*

U.S. Cl. 424—270 **8 Claims**

1. A 2-aryl-5-alkyl-3,4-dioxo-1,2,5-thiadiazolidine-1-oxide of the formula



in which

Ar is phenyl substituted with at least one of halogen, methyl, ethyl, halogenomethyl or halogenoethyl, and

R is alkyl with 1 to 6 carbon atoms.

7. A method of combaitng fungi, which comprises applying to the fungi, or to a habitat thereof, a fungicidally effective amount of a compound according to claim 1.

4,255,438

METHOD FOR REDUCTION OF CARDIAC MORTALITY RATE USING PYRAZOLIDINE-3,5-DIONES

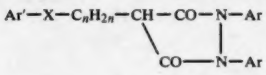
Sydney H. Kane, Warren, and Erwin Margulies, Morganville, both of N.J., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation-in-part of Ser. No. 897,973, Apr. 20, 1978, abandoned. This application May 7, 1979, Ser. No. 36,923

Int. Cl.³ A61K *31/415*

U.S. Cl. 424—273 P **16 Claims**

1. A method for reducing the mortality rate among subjects who have survived at least one recent myocardial infarction, comprising the enteral administration of pharmaceutical compositions containing about 800 mg of a compound of the formula



wherein Ar represents phenyl, (lower alkyl)-phenyl or (lower alkoxy)-phenyl, Ar' stands for phenyl, tolyl, (lower alkoxy)-phenyl or (halogeno)-phenyl, X represents oxy, thio, sulfinyl or sulfonyl and n is an integer from 1 to 4, or a pharmaceutically acceptable salt thereof; daily in divided unit dosages during the period of months 2 to 12 post infarction.

4,255,439

MEANS AND METHOD FOR AIDING INDIVIDUALS TO STOP SMOKING

Irving Cooper, 20 Westgate Rd., Newton Centre, Mass. 02159

Filed Jul. 13, 1979, Ser. No. 57,288

Int. Cl.³ A61K *31/415*

U.S. Cl. 424—273 R **14 Claims**

1. A method of aiding individuals to stop smoking and lose overweight, said method comprising administering to a patient in need thereof a

combination consisting essentially of a therapeutically effective amount of a 2-imidazoline derivative selected from the group consisting of 2-[2,6-dichlorophenylamino]-2-imidazoline hydrochloride, naphazoline, tetrahydrazoline, oxymetazoline, xylometazoline, tolazoline, antazoline and mixtures thereof, and an anorectic effective amount of an anorectic.

4,255,440

FURAN DERIVATIVES HAVING SELECTIVE ACTIO[illegible] ON HISTAMINE RECEPTORS

Barry J. Price, Hertford; John W. Clitherow, Sawbridgeworth, and John Bradshaw, Ware, all of England, assignors to Allen & Hanburys Limited, England

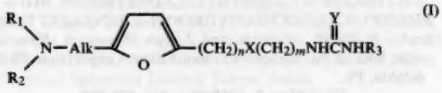
Division of Ser. No. 818,762, Jul. 25, 1977, Pat. No. 4,128,658. This application Oct. 13, 1978, Ser. No. 951,026

Claims priority, application United Kingdom, Aug. 4, 1976, 32465/76; Dec. 6, 1976, 50685/76; May 13, 1977, 20187/77

Int. Cl.³ C07D *405/06, 413/06;* **A61K** *31/40, 31/535*

U.S. Cl. 424—274 **25 Claims**

1. A compound of the general formula I:



(I)

or a physiologically acceptable acid addition salt, N-oxide or hydrate thereof, in which R_1 and R_2 together with the nitrogen atom to which they are attached, form a 5- or 6-membered saturated heterocyclic ring selected from the group consisting of morpholino, piperidino, pyrrolidino, and N-alkylpiperazino;

R_3 is hydrogen, lower alkyl, lower alkenyl or alkoxyalkyl; X is $-CH_2-$, $-O-$ or $-S-$;

Y represents $=S$, $=O$, $=NR_5$ or $=CHR_6$;

Alk denotes a straight or branched alkylene chain of 1 to 6 carbon atoms;

R_5 is H, nitro, cyano, lower alkyl, phenyl, phenyl substituted by alkyl, alkoxy or halogen, alkylsulphonyl, or arylsulphonyl in which the aryl moiety is phenyl or phenyl substituted by alkyl, alkoxy or halogen;

R_6 represents nitro, arylsulphonyl in which the aryl moiety is phenyl or phenyl substituted by alkyl, alkoxy or halogen, or alkylsulphonyl;

m is an integer from 2 to 4; and

n is 1 or 2; or when X is —S— or $-CH_2-$, n is zero, 1 or 2.

17. A pharmaceutical composition for treating a condition mediated through histamine H_2-receptors, comprising a pharmaceutically effective amount of a compound as claimed in claim **1** in association with a pharmaceutically acceptable carrier or diluent.

4,255,441

β-LACTAM ANTIBIOTICS, A PROCESS FOR THEIR PREPAERATION AND THEIR USE IN PHARMACEUTICAL COMPOSITIONS

Roger J. Ponsford, Wimblehurst Park; Andrew J. G. Baxter, Albina Garth, and Robert Southgate, Warnham, all of England, assignors to Beecham Group Limited, England

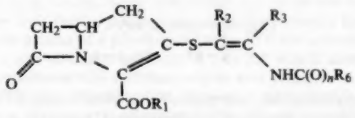
Filed Jan. 19, 1979, Ser. No. 4,896

Claims priority, application United Kingdom, Mar. 14, 1978, 9985/78

Int. Cl.[3] **C07D** *487/04;* **A61K** *31/40*

U.S. Cl. 424—274 **46 Claims**

1. A compound of the formula:



wherein

R_1 is hydrogen; a pharmaceutically acceptable cation; lower alkyl; lower alkyl substituted with lower alkoxy; benzyl; benzyl substituted with lower alkoxy, nitro or chloro; acetoxymethyl; pivaloyloxymethyl; α-ethoxycarbonyloxyethyl; or phthalidyl;

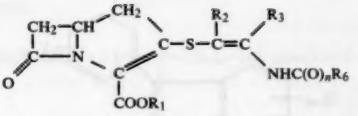
R_2 is hydrogen or lower alkyl;

R_3 is hydrogen or lower alkyl;

R_6 is phenyl or phenyl substituted with one or two members selected from the group consisting of fluoro, chloro, lower alkyl or lower alkoxy; and

n is 1 or 2.

19. A pharmaceutical composition useful in the treatment of bacterial infections in humans and animals which comprises an antibacterially effective amount of at least one compound of the formula:



wherein

R_1 is hydrogen; a pharmaceutically acceptable cation; lower alkyl; lower alkyl substituted with lower alkoxy; benzyl; benzyl substituted with lower alkoxy, nitro or chloro; acetoxymethyl; pivaloyloxymethyl; α-ethoxycarbonyloxyethyl; or phthalidyl;

R_2 is hydrogen or lower alkyl;

R_3 is hydrogen or lower alkyl;

R_6 is phenyl or phenyl substituted with one or two members selected from the group consisting of fluoro, chloro, lower alkyl or lower alkoxy; and

n is 1 and 2, in combination with a pharmaceutically acceptable carrier.

4,255,442

2-[(METHYLSULFINYL)]-3-PHENYLINDOLES

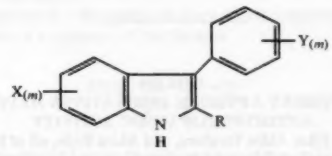
Martin Steinman, Livingston, and Pirouz Tabhaz, Cedar Grove, both of N.J., assignors to Schering Corporation, Kenilworth, N.J.

Continuation-in-part of Ser. No. 930,274, Aug. 2, 1978, abandoned, which is a continuation-in-part of Ser. No. 828,355, Aug. 29, 1977, abandoned. This application Nov. 28, 1979, Ser. No. 98,165

Int. Cl.[3] **C07D** *209/02, 31/40*

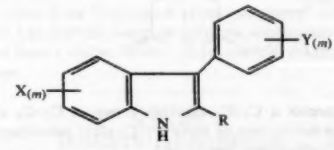
U.S. Cl. 424—274 **19 Claims**

1. A compound of the formula



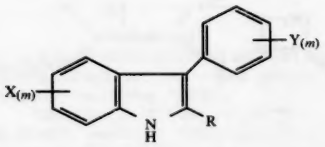
wherein each of X and Y are halogeno, (n) is an integer of zero to three, an R is methylsulfinylacetyl, methylsulfonylacetyl, methylthiohydroxyacetyl, methylthioalkoxyacetyl, methylsulfonylhydroxyethyl, or methylsulfonylhydroxyethyl.

17. A method for treating rheumatoid arthritis which comprises administering to a mammal suffering from rheumatoid arthritis a therapeutically effective quantity of a compound having the formula



wherein each of X and Y are halogen, (n) is an integer of zero to three, and R is methylsulfinylacetyl, methylsulfonylacetyl, methylthiohydroxyacetyl, methylthioalkoxyacetyl, methylsulfinylhydroxylethyl, or methylsulfonylhydroxyethyl together with a pharmaceutically acceptable carrier.

18. A method of eliciting an immunosuppressant response in a mammal suffering from a disease state responsive to an immunosuppressant which comprises administering a therapeutically effective amount of a compound of the formula



wherein each of X and Y are halogeno, (n) is an integer of zero to three, and R is methylsulfinylacetyl, methylsulfonylacetyl, methylthiohydroxyacetyl, methylthioalkoxyacetyl, methylsulfinylhydroxyethyl, or methylsulfonylhydroxyethyl together with a pharmaceutically acceptable carrier.

4,255,443

HOMOCYSTEINE THIOLACTONE PERCHLORATE AS A TUMOR PROMOTOR

Kilmer S. McCully, Boston, Mass., assignor to The United States of America as represented by the Department of Health, Education and Welfare, Washington, D.C.

Continuation of Ser. No. 734,129, Oct. 20, 1976, abandoned, which is a continuation-in-part of Ser. No. 534,836, Dec. 20, 1974, abandoned. This application Nov. 16, 1979, Ser. No. 94,814

Int. Cl.[3] **A61K** *31/38*

U.S. Cl. 424—275 **1 Claim**

1. A method of promoting the growth of malignant tumors in laboratory animals such as mice and rabbits which comprises utilizing intraperitoneally an effective amount of homocysteine thiolactone perchlorate in said laboratory animals.

4,255,444

4-HYDROXY-2-PYRONE DERIVATIVES HAVING ANTIHYPERLIPAEMIC ACTIVITY

Hidehiko Oka; Akira Terahara, and Akira Endo, all of Hiromachi, Japan, assignors to Sankyo Company Limited, Tokyo, Japan

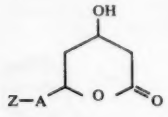
Filed Oct. 26, 1979, Ser. No. 88,621

Claims priority, application Japan, Oct. 30, 1978, 53-133406

Int. Cl.[3] **C07D** *309/30;* **A61K** *31/365*

U.S. Cl. 424—279 **27 Claims**

1. A compound of formula (I):



(I)

wherein

A represents a C_1–C_2 alkylene group, a C_1–C_4 alkylene group having one or more C_1–C_3 alkyl substituents, or a C_2–C_3 alkenylene group; and

Z represents an aromatic ring group selected from the group consisting of (i) a phenyl, naphthyl or tetrahydronaphthyl group, (ii) a substituted phenyl, naphthyl or tetrahydronaphthyl group wherein the aromatic ring is substituted with at least one substituent selected from the group consisting of halogen atoms and C_1–C_3 alkyl groups, (iii) phenoxy or naphthoxy group, and (iv) a substituted phenoxy or naphthoxy group wherein the aromatic ring is substituted with one or more halogen atoms.

4,255,445

8-HYDROXY-6,7-(2-METHYL-2,3-DIHYDROFURO)-1-PHENYL-2,3,4,5-TETRAHYDRO-1H-3-BENZAZEPINES

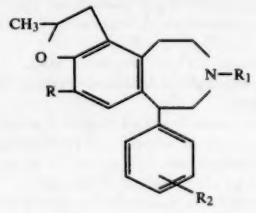
Charles K. Brush, Malvern, and Joseph Weinstock, Phoenixville, both of Pa., assignors to SmithKline Corporation, Philadelphia, Pa.

Filed Mar. 7, 1980, Ser. No. 128,009

Int. Cl.[3] **A61K** *31/55;* **C07D** *491/048*

U.S. Cl. 424—285 **9 Claims**

1. A compound of the structural formula:



in which R is hydroxy or methoxy, R_1 is hydrogen, methyl or allyl and R_2 is hydrogen, methoxy, hydroxy, methyl, methylthio, trifluoromethyl or halo; together with a pharmaceutically acceptable acid addition salt or O-lower alkanoyl ester thereof.

7. The method of inducing peripheral dopaminergic activity in a subject in need thereof comprising administering orally or parenterally thereto a nontoxic dopaminergic quantity of a compound of claims **1**, **2**, **3**, **4**, **5** or **6**.

4,255,446

CYSTEINE DERIVATIVES

Jun-ichi Iwao, Takarazuka; Masayuki Oya, Ibaragi, and Takehisa Chiba, Kyoto, all of Japan, assignors to Santen Pharmaceutical Co. Ltd., Osaka, Japan

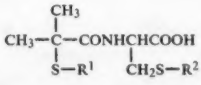
Filed Oct. 5, 1979, Ser. No. 82,331

Claims priority, application Japan, Oct. 11, 1978, 53-125539

Int. Cl.[3] **A61K** *31/265, 31/195;* **C07C** *153/00, 149/243*

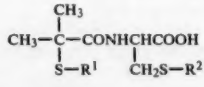
U.S. Cl. 424—301 **17 Claims**

1. A compound of the formula



and a physiologically acceptable salt thereof within R^1 and R^2 are straight or branched C_1–C_6 alkanoyl, benzoyl, or C_1–C_6 alkyl substituted by carboxy and wherein R^1 and R^2 are the same.

7. A method for suppressing liver disorder in a mammal suffering from a liver disorder comprising administering an amount effective to suppress said liver disorder of a compound of the formula



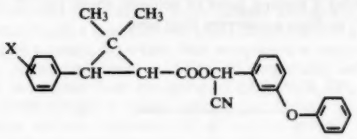
and a physiologically acceptable salt thereof wherein R^1 and R^2 are straight or branched C_1–C_6 alkanoyl, benzoyl, C_1–C_6 alkyl or C_1–C_6 alkyl substituted by carboxy; either R^1 or R^2 may be hydrogen.

4,255,447
ACARICIDAL COMPOUNDS OF CYCLOPROPANE CARBOXYLIC ACID DERIVATIVES

Kiyomi Ozawa; Shigeru Ishii, both of Funabashi; Mamoru Hayashi, Shiraoka; Masayoshi Hirose, Shiraoka, and Kiminori Hirata, Shiraoka, all of Japan, assignors to Nissan Chemical Industries Limited, Tokyo, Japan

Filed Aug. 9, 1979, Ser. No. 65,340
Claims priority, application Japan, Sep. 12, 1978, 53-112107
Int. Cl.[3] A01N *53/00;* C07C *121/75*
U.S. Cl. 424—304 11 Claims

1. An acaricidal compound of phenylcyclopropane carboxylic acid derivatives having the formula



(I)

wherein X represents a C_2–C_{10} straight or branched alkyl group.

10. The compound of claim 1, wherein X is $(CH_3)_2CHCH_2$—.

4,255,448
METHOD FOR REDUCING EPILEPTIFORM ACTIVITY

Ruggero G. Fariello, Madison, Wis., assignor to Wisconsin Alumni Research Foundation, Madison, Wis.

Filed Sep. 10, 1979, Ser. No. 74,049
Int. Cl.[3] A61K *31/185*
U.S. Cl. 424—315 2 Claims

1. A method for reducing epileptiform activity comprising administering an effective amount to one having epileptiform activity from 3-aminopropane sulfonic acid.

4,255,449
METHOD OF TREATING ABNORMAL LIPOPROTE IN RATIOS

Claudio Cavazza, P.O. Box 23, Chiasso, Switzerland

Continuation-in-part of Ser. No. 9,134, Feb. 5, 1979, abandoned. This application Oct. 10, 1979, Ser. No. 83,418
Claims priority, application Italy, Feb. 3, 1978, 47900 A/78; May 15, 1978, 49353 A/78
Int. Cl.[3] A61K *31/205*
U.S. Cl. 424—316 4 Claims

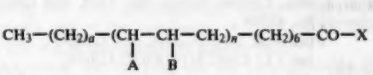
1. The method of increasing the level of high density lipoproteins so as to selectively reduce the ratio of (a) low density and very low density lipoproteins to (b) high density lipoprotein in the plasma of a patient in which said ratio is abnormally above a normal range of about 1.5 to 2.7 which comprises orally or parenterally administering to said patient in a single or multiple dose administration regimen an amount of L-carnitine or a pharmaceutically acceptable salt thereof which is sufficient upon administration according to said regimen to reduce said abnormally high ratio.

4,255,450
USE OF AMINOHYDROXY ACID AMIDES AS ANTIMICROBIAL SUBSTANCES

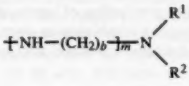
Holger Tesmann, Düsseldorf; Horst Rutzen, Langenfeld, and Frau E. Börner, Düsseldorf, all of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien (Henkel KGaA), Düsseldorf-Holthausen, Fed. Rep. of Germany

Filed May 29, 1979, Ser. No. 42,793
Claims priority, application Fed. Rep. of Germany, May 31, 1978, 2823685
Int. Cl.[3] A01N *37/18;* A61K *31/16*
U.S. Cl. 424—320 5 Claims

1. A method for reducing microbial activity which comprises adding to a material subject to microbial contamination an effective amount of an aminohydroxy stearic acid amide of the formula



wherein n=1 and a=7, n=2 and a=4, or n=3 and a=1 and wherein one of A and B represents a hydroxyl group and the other of A and B, and X, each represent a radical of the formula



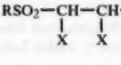
wherein b is an integer of from 2 to 6, m is 1 or 2, and R^1 and R^2 are each independently hydrogen or an alkyl radical having from about 1 to 12 carbon atoms, or a mixture of said amides.

4,255,451
ALGICIDAL AND FUNGICIDAL 1-HALO-2-SUBSTITUTED-THIOETHYL SULFONES, 2-SUBSTITUTED-THIOVINYL SULFONES, AND 1,2-DIHALOTHIOETHYL SULFONES

Philip S. Magee, Vallejo, Calif., assignor to Chevron Research Company, San Francisco, Calif.

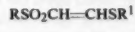
Division of Ser. No. 912,778, Jun. 5, 1978, Pat. No. 4,196,152, which is a continuation-in-part of Ser. No. 814,013, Jul. 7, 1977, abandoned, which is a continuation-in-part of Ser. No. 657,677, Feb. 2, 1976, abandoned. This application Jul. 23, 1979, Ser. No. 60,114
Int. Cl.[3] A01N *41/10*
U.S. Cl. 424—337 7 Claims

1. A method for the control of fungi which comprises applying thereto a compound of the formula



wherein X is chloro or bromo, and one of R or R^1 is alkyl of 1 to 6 carbon atoms, and the other R or R^1 group is phenyl or phenyl substituted with 1 to 2 of the same or different substituents selected from fluoro, chloro, bromo, nitro or alkyl of 1 to 4 carbon atoms.

3. A method for the control of fungi which comprises applying thereto a compound of the formula



wherein one of R or R^1 is alkyl of 1 to 6 carbon atoms and the other R or R^1 group is phenyl or phenyl substituted with 1 to 2 of the same or different substituents selected from fluoro, chloro, bromo, nitro or alkyl of 1 to 4 carbon atoms.

4,255,452
COSMETIC COMPOSITION

Ruby G. Veney, 4520 Pine St., Philadelphia, Pa. 19143

Filed Mar. 19, 1979, Ser. No. 21,551
Int. Cl.[3] A61K *7/48*
U.S. Cl. 424—359 1 Claim

1. A composition for cleansing, smoothing and moisturizing the skin consisting of a mixture of about 25 to 35 parts by weight non-fat dry milk solids, about 15 to 25 parts by weight witch hazel, about 35 to 45 parts by weight olive oil, and about 150 to 200 parts by weight of water.

4,255,453

PRODUCTION OF ISOCYANIC ACID AND ISOCYANATES

Robert K. Jordan, Carlton House, Ste. 1431, 550 Grant St., Pittsburgh, Pa. 15219

Filed Aug. 16, 1977, Ser. No. 825,096
Int. Cl.[3] C01C *3/14*; C07C *118/00*
U.S. Cl. 423—365 **6 Claims**

1. A process for the production of isocyanates and homopolymers thereof comprising combining a metal N-mono organic substituted carbamate and carbon monoxide.

3. A process for the production of isocyanaic acid and homopolymers thereof comprising combining a metal salt of carbamic acid and carbon monoxide.

5. A process for the production of isocyanates and homopolymers thereof comprising combining an ester of carbamic or an N-mono organic substituted carbamic acid and carbon monoxide.

4,255,454

THERMAL DESTABILIZATION OF MICROBIAL RENNET

Sven Branner-Jorgensen, 24 Johannevej, DK-2920 Charlottenlund, Denmark, assignor to Sven Branner-Jorgensen, Charlottenlund, Denmark

Filed Dec. 28, 1978, Ser. No. 973,937
Int. Cl.[3] A23C *19/02, 21/00*; C12N *9/58*
U.S. Cl. 426—36 **6 Claims**

1. A method for producing microbial rennet having reduced thermal stability for use in making cheese comprising reacting microbial *Mucor miehei* rennet or *Mucor pusillus* rennet with a monocarboxylic acid acyl radial of between 1 and 6 carbon atoms in an aqueous medium at a pH between about 6 and about 11 and at a temperature between about 0° C. and about 40° C. to produce an acylated microbial rennet having reduced thermal stability of at least about 3° C. and having at least about 50% of the activity before acylating.

4,255,455

PREPARATION OF CASEIN WITH LOWERED CHOLESTEROL CONTENT

Alta J. Hefley, Arlington Heights, and Henry P. Furgal, Lombard, both of Ill., assignors to Miles Laboratories, Inc., Elkhart, Ind.

Filed Mar. 12, 1979, Ser. No. 19,313
Int. Cl.[3] A23C *9/00, 7/00*
U.S. Cl. 426—42 **11 Claims**

1. A method for recovering casein having a reduced cholesterol content comprising solubilizing in a medium selected from the group consisting of skim milk, mixture of nonfat dry milk solids or casein containing cholesterol and water from 0.05% to 1.0% on a weight/volume basis based upon the total volume of the aqueous medium an emulsifying agent having a hydrophilic lipophilic balance of about 7 to 16 at a temperature of from about 4° to 45° C. for a time between about 1 to 90 minutes and then isolating the casein from said medium whereby casein is produced having less than 50% on a dry weight basis of the initial cholesterol bound thereto.

4,255,456

ROASTED GROUND WHEAT COATING

Phillip S. Arendt, Chaska, Minn., assignor to Peavey Company, Minneapolis, Minn.

Filed Nov. 22, 1978, Ser. No. 962,914
Int. Cl.[3] A21D *15/08*
U.S. Cl. 426—64 **3 Claims**

1. The method of preparing a coating for baked and leavened food products which comprises the steps of:

(a) selecting a portion of whole grain product which consists essentially of a malted whole grain product selected from the group consisting of malted wheat and malted barley, wherein the whole grain product has been ground to a particle size of less than about 70 mesh;

(b) soaking a second portion of whole grain wheat in an aqueous solution of a food grade acid to increase the water content to between about 30% and 33%, and roasting said soaked whole grain wheat so as to reduce the water content to less than about 4% to form a treated wheat product, and thereafter grinding said dried wheat portion to a particle size of less than about 70 mesh; and

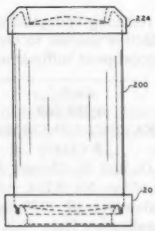
(c) mixing said first and second ground wheat portions with a carrier of an edible oil selected from the group consisting of vegetable oils of soy and cottonseed origin and hydrogenated beef tallow and mixtures thereof, with said edible oil having a melting point of between about 100° F. and 117° F. to form a coherent fluid mass.

4,255,457

METHOD AND APPARATUS FOR PREVENTING BUCKLE OF BEER CANS DURING PASTEURIZATION

George J. Collias, Oak Park, Ill., assignor to Kepros-Ganes Company, Oak Park, Ill.

Continuation-in-part of Ser. No. 940,563, Sep. 8, 1978. This application Dec. 10, 1979, Ser. No. 101,580
Int. Cl.[3] A23L *3/04, 3/10*
U.S. Cl. 426—407 **2 Claims**



1. In the processing of canned beer wherein each can has a top panel, a sidewall and a bottom integral with said sidewall, the bottom of the can including a bottom panel covering the central portion of the bottom of the can, an inner base wall extending outwardly from said bottom panel and away from said top wall and joined to the bottom panel by a first curved radius portion, and an outer base wall extending inwardly from said sidewall and away from said top wall and joining the sidewall to the inner base wall by a second curved radius portion, a method for preventing buckling of the can's bottom during pasteurization, comprising:

capturing the bottom of the can within an anti-buckle ring which braces the can's inner base wall and first and second radius portions from substantial inner radial displacement while leaving the bottom panel exposed thus permitting the bottom panel to bulge outwardly such that outward bulge of the can's bottom panel during pasteurization of the beer does not separate the ring means from the can, and buckling of the bottom of the can is prevented by virtue of the inner base wall being held from substantial radial displacement;

transporting the can through a pasteurizatiion station with the ring mated with the can; and

automatically removing the ring from the can subsequent to pasteurization.

4,255,458

METHOD FOR THE SELECTIVE EXTRACTION OF CAFFEINE FROM VEGETABLE MATERIALS

Ludwig Roselius, Bremen; Hans-Albert Kurzhals, Heibenbüttel, and Peter Hubert, Bremen, all of Fed. Rep. of Germany, assignors to Hag Aktiengesellschaft, Bremen, Fed. Rep. of Germany

Filed Jun. 12, 1978, Ser. No. 914,811

Claims priority, application Fed. Rep. of Germany, Jun. 16, 1977, 2727191

Int. Cl.[3] A23F *3/20, 3/38, 5/20, 5/22*

U.S. Cl. 426—424 20 Claims

1. A method for the selective extraction of caffeine or caffeine and other undesired stimulants as indicated by carboxylic-5-hydroxytryptamides from caffeine containing vegetable material with a liquid solvent characterized in that a two-component solution, (a) whose first component is inherently gaseous under operational conditions of temperature and pressure and is selected from the group of CO_2, N_2O, SF_6, Xe, CF_4, methane, ethane, ethylene, acetylene or cyclopropane, and (b) whose second component is an organic solvent which, by itself, has physical properties such that a mixture of (a) and (b) is liquid at the operating temperature, is used as a liquid solvent for said selective extraction of caffeine at a pressure of 50–300 bar pressure and wherein the relative amount of said first component to said second component is such that said pressure for the extraction is obtained, and further provided that when said solution contains one flammable component, the ratio of the first component to the second component is such that the solution is nonexplosive when mixed with air, and separating said liquid solvent containing caffeine from said vegetable material.

4,255,459

BLANCHING, PASTEURIZING AND STERILIZING PROCESS AND APPARATUS SUITABLE THEREFOR

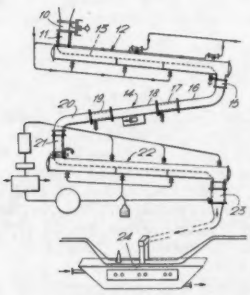
Donald H. G. Glen, 83 Merivale St., Tumut, New South Wales, Australia

Filed Feb. 12, 1979, Ser. No. 11,365

Claims priority, application Switzerland, Feb. 10, 1978, 1483/78

Int. Cl.[3] A01G *1/04*

U.S. Cl. 426—521 2 Claims



1. A continuous process for the rapid blanching and sterilization of foodstuffs in particulate form, such as portions of fruit, vegetables, meat or fish, which comprises continuously moving said foodstuff particles first through an elongated pressure chamber where it is subjected under pressure to hot steam or gas to rapidly heat the outer portion thereof an to supply sufficient heat to heat the foodstuff particles throughout to the sterilization temperature thereof, then moving the thus heated foodstuff particles through an elongated chamber where the pressure drops and said particles are maintained under adiabatic conditions until the particles attain the sterilizing temperature throughout for the time necessary to inactivate or destroy the microorganisms and enzymes, then moving the particles of foodstuff through a cooling unit to effect cooling of the product, moving the cooled product through an enclosed conveying system to a packing unit where it can be packed asceptically, all of the movement of the foodstuff particles being effected at least partly by gravity feed.

2. Apparatus for carrying out the process of rapid heat blanching of foodstuff particulates which comprises an elongated steam pressure chamber through which the foodstuff first moves, an adjacent elongated chamber under a pressure lower than said steam pressure chamber through which the foodstuff next moves and wherein the pressure drops while the foodstuff is adiabatically heated, a cooling unit connected to said adjacent elongated chamber through which the adiabatically heated foodstuff then passes and is there cooled, and an elongated enclosed conveying system connected to said cooling unit and to a packing unit for conveying the foodstuff to the packing unit, all of said chambers and units being connected and angled to give a gravity feed.

4,255,460

TERPINYL METHYL ETHER

Cynthia J. Mussinan, Bricktown; Braja D. Mookherjee, Holmdel; Manfred H. Vock, Locust; Frederick L. Schmitt, Holmdel, all of N.J.; Edward J. Shuster, Brooklyn, N.Y.; James M. Sanders, Eatontown, N.J.; Bette M. Light, Highlands, N.J., and Edward J. Granda, Englishtown, N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

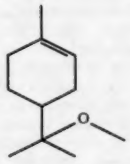
Division of Ser. No. 12,798, Feb. 16, 1979, which is a division of Ser. No. 939,897, Sep. 5, 1978, Pat. No. 4,163,068, which is a division of Ser. No. 872,937, Jan. 27, 1978, Pat. No. 4,131,687.

This application Oct. 26, 1979, Ser. No. 88,650

Int. Cl.[3] A23L *1/226*

U.S. Cl. 426—538 1 Claim

1. A process for imparting to a foodstuff a sweet, vegetable celery-like, spicy aroma characteristic with an earthy nuance and a woody, celery-like, earthy flavor characteristic with sweet and spicy nuances comprising the step of adding to said foodstuff from 0.5 ppm up to about 100 ppm of synthetically produced substantially pure α-terpinyl methyl ether having the structure:



4,255,461

PREPARATION OF A DECAFFEINATED ROASTED COFFEE BLEND

George A. Jasovsky, Bayonne, and Martin Gottesman, Paramus, both of N.J., assignors to General Foods Corporation, White Plains, N.Y.

Filed Nov. 13, 1979, Ser. No. 93,787

Int. Cl.[3] A23F *5/20*

U.S. Cl. 426—595 5 Claims

1. A method of preparing a roasted coffee blend comprising the steps of:

(a) moisturizing a lower-grade green coffee fraction to a moisture level of between 37 and 50% by weight,

(b) decaffeinating the moisturized coffee of step (a) by contact with a stream of a moist supercritical fluid at a temperature of at least 100° C. and a pressure of at least 200 atmospheres,

(c) combining the decaffeinated, lower-grade coffee fraction at a weight level of between 30 and 80% either before

roasting with a higher grade green coffee fraction or after roasting with a higher grade roast coffee fraction.

4,255,462

METHOD OF PRODUCING POLYVINYLIDENE FLUORIDE COATINGS

Peter Gebauer; Wilhelm Käufer, both of Troisdorf, and Helmut Möhrke, Troisdorf-Sieglar, all of Fed. Rep. of Germany, assignors to Dynamit Nobel Aktiengesellschaft, Troisdorf, Fed. Rep. of Germany

Division of Ser. No. 746,442, Dec. 1, 1976, Pat. No. 4,185,000. This application Jul. 31, 1978, Ser. No. 929,609

Claims priority, application Fed. Rep. of Germany, Dec. 5, 1975, 2554765

Int. Cl.³ B05D *1/06*

U.S. Cl. 427—27 **5 Claims**

1. In a method of coating a metal or inorganic oxidic surface with a powder resin coating composition, said coating composition being a homopolymer or a copolymer of polyvinylidene fluoride having a melt flow index of 50–300 grams per ten minutes as determined in accordance with ASTM D 1238 Condition J, wherein said powder resin is applied to said surface and fused thereon, the improvement comprising employing with the powder resin coating composition 5–40 parts by weight of glass based upon a total of 100 parts by weight of resin and glass, wherein said glass is in the form of balls or spheres having a particle size of 5–160 μ.

4,255,463

METHOD OF DEPOSITION OF SILICON IN FINE CRYSTALLINE FORM

Ulrich Rucha, Neufahrn, and Wolfgang Dietze, Munich, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Jul. 18, 1979, Ser. No. 58,455

Claims priority, application Fed. Rep. of Germany, Jul. 19, 1978, 2831819

Int. Cl.³ C01B *33/02*

U.S. Cl. 427—51 **4 Claims**

1. Method of deposition of silicon in fine crystalline form upon a silicon substrate which is directly heated by an electric current from a reaction gas of a silicon-halogen compound and hydrogen which comprises, at a set mole ratio of the reaction gas and throughput selected for the deposition process, setting the deposition rate-determining temperature of the substrate, at the beginning of deposition, at a temperature, above 900° C. but lower than 1050° C. for deposition of silicon thereon, maintaining said temperature during a first deposition phase, thereafter, raising the temperature of the substrate to about 1100° C. while maintaining the mole ratio of the reaction gas and the throughput, and maintaining said temperature for the remainder of the deposition to produce polycrystalline silicon rods.

4,255,464

METHOD FOR THE MANUFACTURE OF OBJECTS FROM AN UNSATURATED POLYESTER COMPOSITION

Ludovicus H. van der Kallen, Bergen op Zoom, Netherlands, assignor to Akzo N.V., Arnhem, Netherlands

Filed Dec. 29, 1978, Ser. No. 974,240

Claims priority, application Netherlands, Dec. 30, 1977, 7714570

Int. Cl.³ B05D *3/06*

U.S. Cl. 427—54.1 **6 Claims**

1. In the processing of an assembly of laminae of reinforcing material impregnated with an unsaturated polyester composition which contains an ethylenically unsaturated monomer to form a cured unitary article at least two mm. thick which is impractical to enclose in an inert atmosphere to avoid contact with ethylenically unsaturated monomer emitted from the composition, the method which comprises initially exposing in air the assembly of impregnated reinforcing material containing 0.03 to 0.3% by weight of a photoinitiator based on the weight of polyester resin to ultraviolet radiation of a low pressure ultra-violet lamp having a wave length of 250 to 600 nm to reduce volatilization of said monomer into the surrounding atmosphere during the curing step, and thereafter curing the composition in the presence of a radical initiator and an accelerator at a temperature below 70° C.

4,255,465

METHOD OF PRODUCING JOSEPHSON-EFFECT JUNCTIONS

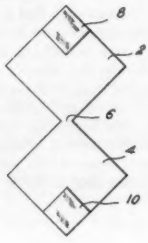
Paul Bernard, Echirolles, and Daniel Zenatti, Veurey, both of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed Aug. 20, 1974, Ser. No. 499,007

Claims priority, application France, Aug. 28, 1973, 73 31061

Int. Cl.³ H01L *39/22*

U.S. Cl. 427—62 **5 Claims**



1. A method of producing Josephson-effect junctions characterised in that a thin and uniform deposit of a superconductive refractory material is made on an insulating substrate, the said deposit is defined to give it the shape of a bridge between two studs of greater width than said bridge, and the said junction at a very low temperature is then subjected to at least one current pulse to change the said deposit from a condition in which said deposit does not exhibit the Josephson-effect to a condition in which said deposit exhibits the Josephson effect, said bridge having dimensions such that prior to application of said current pulse said deposit does not exhibit the Josephson effect.

4,255,466

CARBON ELECTRODE AND MANUFACTURE THEREOF

Isamu Natsume, Komae; Yoshimichi Kobayashi, Tokyo, and Toshinao Itou, Nirasaki, all of Japan, assignors to Mitsubishi Chemical Industries, Limited, Tokyo, Japan

Continuation of Ser. No. 589,749, Jun. 24, 1975, abandoned. This application Feb. 14, 1977, Ser. No. 768,369

Claims priority, application Japan, Jun. 24, 1974, 49-71999

Int. Cl.³ B05D *3/02;* **C25B** *11/12*

U.S. Cl. 427—113 **8 Claims**

1. A carbon electrode wherein the pores of the carbonaceous material are filled and coated with a hardened polyurethane resin and wherein the outer surface of the carbon material of the electrode is uncoated.

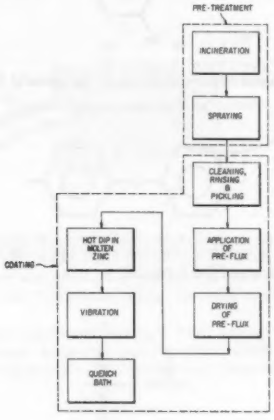
2. A process for preparing a carbon electrode which comprises: immersing a porous carbonaceous material suitable for use as an electrode, into a solution of a thermosettable polyurethane; removing the material from the solution; removing most of the solvent from the impregnated porous carbonaceous material by volatilization; removing the thermosettable polyurethane from the outer surface of the porous carbonaceous material;

and then heat-treating the product to harden the thermosettable polyurethane.

4,255,467
METHOD FOR GALVANIZING SEAFOOD POTS

Edward G. Bounds, 1209 Frederick Ave., Salisbury, Md. 21801

Filed Dec. 22, 1978, Ser. No. 972,370
Int. Cl.[2] C23C 1/02; C23G 5/00
U.S. Cl. 427—142 9 Claims



1. In a method for galvanizing a wire mesh netting seafood pot, the preliminary steps before passing the seafood pot through a caustic cleaning solution and onward to other steps of the galvanizing process of:

passing said wire mesh netting seafood pot through incinerator means to burn, melt and loosen foreign material adhering thereto and contained therewithin, wherein within said incinerator means said seafood pot is passed through a plurality of flame jets arranged about the perimeter and directed toward the interior of said pot, whereby the flame jets play through the wire mesh netting of said pot and reach foreign material contained therewithin; and

passing the seafood pot from the incinerator means through a high pressure liquid spray to remove residual burned matter and loosened foreign material therefrom.

4,255,468
METHOD OF MARKING PAVED SURFACES AND CURABLE TWO-PART EPOXY SYSTEMS THEREFOR

Beverly J. E. Olson, Minneapolis, Minn., assignor to H. B. Fuller Company, St. Paul, Minn.

Filed Oct. 12, 1979, Ser. No. 84,186
Int. Cl.[3] B05C 1/16; B05D 5/10; E01C 5/00
U.S. Cl. 427—137 10 Claims

1. A two-part coating system capable of forming a hard coating, said coating system consisting essentially of:

(a) in a first part, a pigmented liquid curable vicinal epoxide composition comprising a polyglycidyl ether of a polyhydric phenol, said polyglycidyl ether having an average epoxide functionality greater than 1 but less than 3 and an epoxide equivalent weight greater than 150 but less than 1,000; said first part further comprising a glycidyl or polyglycidyl ether of an aliphatic mono-ol or polyol as a viscosity reducing, reactive diluent for said first part;

(b) in an active hydrogen-containing, epoxide-reactive second part, a blended co-reactant for said first part, said blended co-reactant consisting essentially of an amine-epoxy adduct and the following difunctional amines:

$H_2N—R—NH_2$ and

$H_2N—CH_2—Ar—CH_2—NH_2$,

wherein R represents a branched alkylene moiety and Ar represents a divalent aromatic group; said difunctional amines being blended in a weight ratio ranging from 10:90 to about 90:10; said amine-epoxy adduct comprising 5–75% by weight of a reaction product of the components comprising a said difunctional amine, a diglycidyl ether of a dihydric phenol, and an alkyl-substituted monohydric phenol;

said two-part coating system being substantially free of non-reactive, essentially volatile organic liquid diluents and containing a silane adhesion promoter.

7. A method for applying a permanent marking to a paved surface, comprising:

(a) supplying to the point of application a blended co-curative agent consisting essentially of (1) aliphatic polyfunctional amine having the structural formula $H_2N—R—NH_2$, wherein R represents a branched aliphatic chain, and (2) bismethylaminoaromatic polyfunctional amine having the structural formula $H_2N—CH_2—Ar—CH_2—NH_2$, wherein Ar represents a divalent aromatic group; said aliphatic and bismethylaminoaromatic polyfunctional amines being blended in a weight ratio ranging from 10:90 to 90:10;

(b) supplying to the point of application a curable liquid vicinal epoxide composition comprising a polyglycidyl ether of a polyhydric alcohol; said supplying of said curable liquid epoxide composition being controlled so as to provide a ratio of free epoxide equivalents to active hydrogen-bearing amine equivalents ranging from about 1:1 to about 1.5:1;

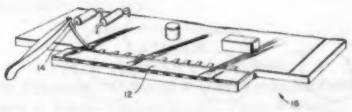
(c) applying the said blended co-curative agent and the said curable liquid epoxide composition to said paved surface, whereby said paved surface is provided with a coating comprising a mixture comprising said blended co-curative agent and said curable liquid epoxide composition; and

(d) permitting said mixture of said step (c) to cure in situ on said paved surface.

4,255,469
PROCESS FOR SELECTIVELY APPLYING A CONFORMAL COATING WITH A MASKING TAPE HAVING AN IMBEDDED WIRE CUTTING EDGE

Patrick J. McGinness, Redondo Beach, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Division of Ser. No. 950,210, Oct. 10, 1978, abandoned. This application Jul. 2, 1979, Ser. No. 54,360
Int. Cl.[3] B05D 1/32
U.S. Cl. 427—282 2 Claims



1. A process of coating only a selected area of a workpiece while leaving an adjacent area coating free, comprising the steps of:

masking the adjacent area of the workpiece with a tape having a wire along an edge thereof, and placing the wire on the boundary between the areas;

applying a coating over the workpiece and the tape;

lifting the wire to sever the coating along the boundary; and removing the tape from the adjacent area.

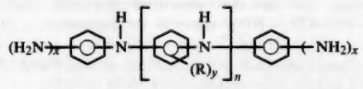
4,255,470

PROCESS FOR PREVENTING POLYMER BUILDUP IN A POLYMERIZATION REACTOR

Louis Cohen; James B. Haehn, both of Avon Lake, and Donald E. Witenhafer, North Olmsted, all of Ohio, assignors to The B. F. Goodrich Company, Akron, Ohio

Filed Jul. 15, 1977, Ser. No. 815,977
Int. Cl.[3] C08F *10/00*
U.S. Cl. 427—230 **10 Claims**

1. A process for substantially eliminating the buildup of polymers on the internal surfaces of a polymerization reaction vessel which comprises applying to said surfaces a coating solution comprised of a polyaromatic amine having a molecular weight in the range of about 250 to about 1000 dissolved in an aqueous acid solution, said polyaromatic amine having the structure



wherein R is H or NH_2, x and y are 1 or 2, and n is from 0 to 5.

4,255,471

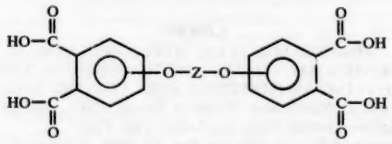
COATING SOLUTION OF POLYETHERIMIDE-FORMING MONOMERS IN A SOLVENT SYSTEM INCLUDING WATER

Edith M. Boldebuck, Schenectady, and Eugene G. Banucci, Scotia, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

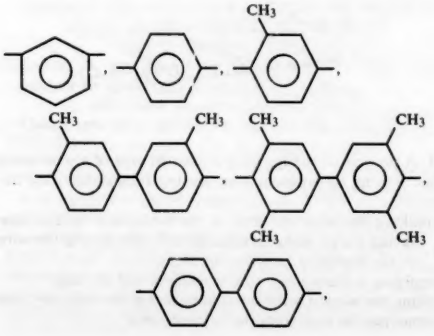
Division of Ser. No. 778,858, Mar. 18, 1977, Pat. No. 4,157,996. This application Nov. 13, 1978, Ser. No. 960,040
Int. Cl.[3] C08G *69/02, 69/26;* C08K *5/06;* B05D *5/12*
U.S. Cl. 427—385.5 **22 Claims**

1. A coating solution comprising:

(1) at least one aromatic bis(ether dicarboxylic acid) having the general formula,



where Z is a member selected from the class consisting of (A) divalent organic radicals having the following formulas,



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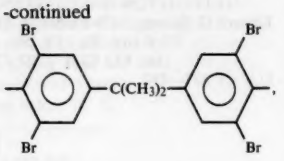
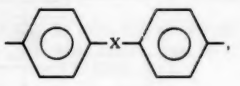
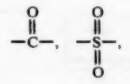


and (B) divalent organic radicals of the general formula,



where X is a member selected from the class consisting of divalent radicals of the formula, $-C_yH_{2y}-$,

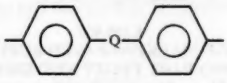


—O— and —S—, where y is an integer from 1 to 5;

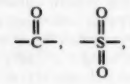
(2) at least one organic diamine having the general formula,

$$H_2N-R-NH_2$$

where R is a divalent organic radical selected from the group consisting of divalent aromatic hydrocarbon radicals having from 6 to 30 carbon atoms and halogenated derivatives thereof, alkylene radicals having from 2 to about 20 carbon atoms, cycloalkylene radicals having from 3 to about 20 carbon atoms, from C_2 to about C_8 alkylene terminated polydiorganosiloxane, and divalent radicals of the general formula



where Q is a member selected from the class consisting of —O—,



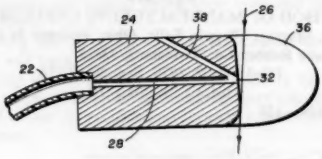
—S—, and $-C_xH_{2x}-$ and x is an integer from 1 to 5; said diamine being present in an amount from about 0.5 to about 2.0 moles per mole of said bis(ether dicarboxylic acid) component; and

(3) a solvent system comprising (A) an organic solvent component selected from the group consisting of monoalkyl ethers of ethylene glycol having from 1 to 4 carbon atoms in the alkyl group, monoalkyl ethers of diethylene glycol having from 1 to 4 carbon atoms in the alkyl group, and mixtures thereof, and (B) water in an amount up to the maximum amount at which the solution is substantially free of precipitate, said bis(ether dicarboxylic acid) and said diamine being dissolved in said solvent system.

4,255,472
METERED FINISH

Louis B. Williams, Jr., Walnut Hill, Fla., assignor to Monsanto Company, St. Louis, Mo.

Filed Jul. 2, 1979, Ser. No. 54,384
Int. Cl.[3] B05D 1/00
U.S. Cl. 427—445 5 Claims



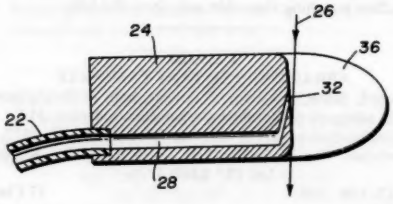
1. In a process for applying finish to a yarn running at least 2500 meters per minute and wherein finish is metered through a passageway just prior to application to said yarn, the improvement comprising interrupting siphoning at the exit of said passageway.

3. In a finish applicator having a finish passageway extending therethrough to an exit end, the improvement comprising means in the application for interrupting siphoning at said exit end.

4,255,473
METERED FINISH

Louis B. Williams, Jr., Walnut Hill, Fla., assignor to Monsanto Company, St. Louis, Mo.

Filed Jul. 2, 1979, Ser. No. 54,387
Int. Cl.[3] B05D 1/00
U.S. Cl. 427—445 9 Claims



1. In a process for applying finish to a yarn running at least 2500 meters per minute and wherein said finish is metered through a passageway just prior to application to said yarn, the improvement comprising maintaining a positive atmospheric gauge pressure adjacent to the exit of said passageway.

6. In a finish applicator wherein finish is metered through a passageway to a yarn, the improvement wherein finish flowing through the exit end of said passageway has a component of motion in opposition to motion of said yarn.

4,255,474
COMPOSITE HAVING TRANSPARENT CONDUCTOR PATTERN

Elroy C. Smith, Jr., La Habra, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Continuation of Ser. No. 925,245, Jul. 17, 1978, abandoned. This application Jan. 4, 1980, Ser. No. 109,935
Int. Cl.[3] B32B 5/00, 17/06
U.S. Cl. 428—46 6 Claims

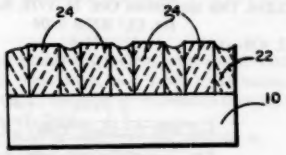
1. A composite comprising:

an integrated circuit device of semiconductor material, and

a substantially continuous layer of transparent material disposed on said integrated circuit device, said layer of transparent material having a first region therein of insulative material and a second region therein of electrically conductive material,

wherein said second region is determined by diffusing a modifying material into a portion of a layer of a first metal disposed on said base whereby said first metal is alloyed with said modifying material;

wherein said insulative material is an oxide of said first metal formed by oxidation of unalloyed parts of said layer of a first metal,



wherein said electrically conductive material is an oxidation product of the alloyed portion of said layer of a first metal,

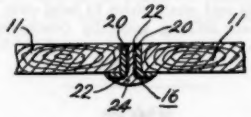
wherein said first metal in said layer has a purity of at least about 99.9% by weight, and

wherein said insulative material is a substantially pure and stoichiometric oxide of said first metal having a resistivity of at least about 1000 ohm-cm.

4,255,475
MOSAIC STRUCTURES

Donald DelGrande, 3526 N. Mascher St., Philadelphia, Pa. 19140

Continuation-in-part of Ser. No. 957,028, Nov. 2, 1978, Pat. No. 4,172,547, and a continuation-in-part of Ser. No. 957,029, Nov. 2, 1978. This application Mar. 22, 1979, Ser. No. 22,653
The portion of the term of this patent subsequent to Oct. 30, 1996, has been disclaimed.
Int. Cl.[3] B23K 1/20; B32B 3/10, 5/16
U.S. Cl. 428—44 10 Claims



1. A substantially self-supporting structure comprising a number of constituent wood members, said members being joined to one another by solder joints, each of said joints comprising a layer of adhesive bonded to each joined surface of said wood members, a metallic layer of solderable particles bonded to each said adhesive layer solderable particles, and a bead of solder bonding each said metallic layer to a corresponding metallic layer.

4,255,476
PILE TEXTILE ELEMENTS

Jean Joly, Craponne, and Joseph Puthon, Lyons, both of France, assignors to Rhone-Poulenc-Textile, Paris, France

Continuation of Ser. No. 705,257, Jul. 14, 1976, abandoned. This application Sep. 19, 1977, Ser. No. 834,294
Claims priority, application France, Jul. 24, 1975, 75 23415; Jun. 3, 1976, 76 17183; Jun. 10, 1976, 76 17904
Int. Cl.[3] D04H 11/00
U.S. Cl. 428—82 10 Claims

1. A pile textile element for decorative pile articles comprising a plurality of filamentary textile materials assembled in a bundle, said filamentary textile materials of the bundle being welded to one another at one end only of the bundle, the other end being free and a removable envelope encasing the bundle

along its entire length, said welded end and envelope securing and stabilizing said filamentary textile materials in said bundle and facilitating handling of said element and a base attached to said welded end of said bundle, said base including magnetic elements for magnetically affixing said base to a support.

4,255,477

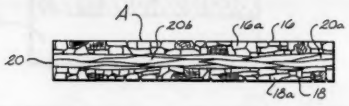
ARTIFICIAL BOARD OF LUMBER

John A. Holman, 426 Sayre St., Anderson, S.C. 29624

Continuation-in-part of Ser. No. 795,203, May 9, 1977, Pat. No. 4,122,236. This application Oct. 24, 1978, Ser. No. 954,888

Int. Cl.³ B32B *9/04*

U.S. Cl. 428—106 **19 Claims**



1. An artificial lumber board comprising:

a plurality of wood strips;

each said wood strip being substantially elongated in length to define first and second spaced ends;

said wood strips having a generally flat configuration including thickened medial portions having a thickness generally less than the width of said wood strip and tapered tip portions reduced in thickness relative to the thickness of said medial portion;

an adhesive coating carried on each said wood strip;

said width of wood strips being substantial to define distinct upper and lower lateral sufraces against which said wood strips are uniformly compressed from one face to an opposing face of said artificial board with all of said lateral surfaces being generally perpendicular to the direction of said compression;

said wood strips extending in general longitudinal alignment in the direction of the longitudinal dimension of said lumber board along the length of said artificial board, said length and taper end portions affording sufficient flexibility enabling said wood strips to bend over one another forming and defining generally continuous sinusoidal wood grain-like structures extending longitudinally throughout said artificial board.

4,255,478

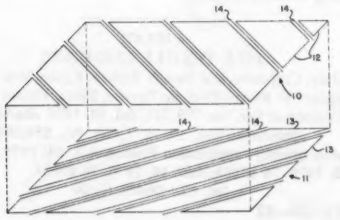
COMPOSITE STRUCTURES

Robert L. Crane, Dayton, Ohio, assignor to The United States of American as represented by the Secretary of the Air Force, Washington, D.C.

Continuation of Ser. No. 909,151, May 24, 1978, abandoned. This application Mar. 14, 1979, Ser. No. 20,301

Int. Cl.³ B32B *5/12*

U.S. Cl. 428—113 **5 Claims**



1. A composite structure comprising a resin tape reinforced with fibers other than boron fibers having a tungsten boride core, the reinforcing fibers being parallel to edges of the tape, and segments of the tape being stacked one upon another so as to form a plurality of plies; and a boron fiber having a tungsten boride core positioned along an edge of each tape segment and having a length about equal to the length of the edge, the tape reinforcing fibers and the boron fibers having about the same failure strain.

4,255,479

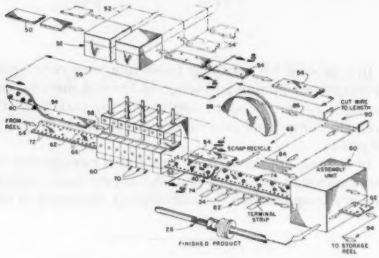
METHOD OF MANUFACTURING CABLE SEALS

Myles N. Murray, Chagrin Falls, Ohio, assignor to Industrial Electronic Rubber Co., Twinsburg, Ohio

Filed Feb. 2, 1979, Ser. No. 8,914

Int. Cl.³ B32B *3/10*

U.S. Cl. 428—131 **17 Claims**



1. A method of manufacturing cable seals of the type having at least one annular sealing ring, said method comprising the steps of:

(a) molding in a mold a plurality of cable seals integrally in a belt in a predetermined pattern with the belt forming such one annular sealing ring,

(b) stripping the belt from the mold, and

(c) then punching the cable seals from the belt.

4,255,480

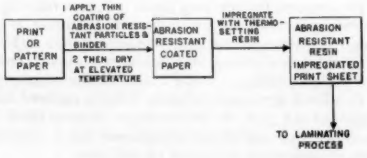
ABRASION-RESISTANT LAMINATE

Herbert I. Scher, and Israel S. Ungar, both of Randallstown, Md., assignors to Nevamar Corporation, Odenton, Md.

Continuation-in-part of Ser. No. 758,265, Jan. 10, 1977, abandoned. This application Feb. 22, 1978, Ser. No. 879,848

Int. Cl.³ B32B *5/16*

U.S. Cl. 428—208 **17 Claims**


PRINT OR PATTERN PAPER
1 APPLY THIN COATING OF ABRASION RESISTANT PARTICLES & BINDER
2 THEN DRY AT ELEVATED TEMPERATURE
ABRASION RESISTANT COATED PAPER
IMPREGNATE WITH THERMO-SETTING RESIN
ABRASION RESISTANT RESIN IMPREGNATED PRINT SHEET
TO LAMINATING PROCESS

1. A method of producing an abrasion resistant decorative laminate from at least one backing layer and a thermosetting resin impregnated decorative facing sheet, said laminate having enhanced abrasion resistance without an overlay layer, the method comprising:

coating a decorative facing sheet with an ultra-thin wet layer of a mixture of (1) an abrasion resistant hard mineral of particle size 20–50 microns in quantity sufficient to provide an abrasion resistant layer without interfering with visibility and (2) binder material for said mineral which binder material has the properties of withstanding the subsequent laminating conditions, being compatible with said thermosetting resin, said binder being present in an amount sufficient to bind said abrasion resistant mineral to

the surface of said decorative facing sheet, and the binder-mineral layer in the dry state being permeable to said thermosetting resin;

drying said coated binder mineral mixture at a temperature sufficient to enhance the bonding of said abrasion resistant material by said binder material to said decorative facing sheet, to provide an ultra-thin dry porous layer of said binder-mineral mixture thereon;

impregnating said coated facing sheet with said thermosetting resin;

assembling said resin impregnated and coated facing sheet over said backing layer; and

subjecting said assembly to heat and pressure sufficient to effect consolidation of said backing layer and said facing sheet to thereby provide said abrasion resistant decorative laminate.

4,255,481

MASK FOR SELECTIVELY TRANSMITTING THERETHROUGH A DESIRED LIGHT RADIANT ENERGY

Donald Dinella, Berkeley Heights, and Ching-Ping Wong, West Windsor Township, Mercer County, both of N.J., assignors to Western Electric Company, Inc., New York, N.Y.

Continuation of Ser. No. 900,368, Apr. 26, 1978, abandoned. This application Sep. 26, 1979, Ser. No. 79,000

Int. Cl.[3] B32B *27/00*

U.S. Cl. 428—209 **5 Claims**

1. A mask for selectively transmitting therethrough a desired light radiant energy, which comprises:

a stress-relieved base, comprising a copolymer of tetrafluoroethylene and hexafluoropropylene, which has been heat treated for a period of time sufficient to render it essentially dimensionally stable and which is capable of transmittting therethrough the light radiant energy, said copolymer base having a thickness of from 5 to 10 mils; and a blocking film formed on at least a portion of said base for blocking the transmission of the light radiant energy through said portion of said base.

4,255,482

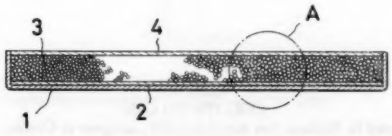
VIBRATION-ABSORBING FIRE-RESISTING FLOOR FOR VEHICLES, VESSELS OR THE LIKE

Nobuo Udagawa, Tokai, Japan, assignor to Takara Kenzai Seisakusho & Co., Japan

Filed Jul. 5, 1978, Ser. No. 922,077

Int. Cl.[3] B32B *7/00, 5/16*

U.S. Cl. 428—215 **12 Claims**



1. A lightweight, vibration-absorbing, fire-resistant floor for a vehicle or vessel comprising a metal substrate having a coating thereon, said coating comprising:

(a) a first layer for contacting with said floor comprising a resin selected from the group consisting of epoxy and urethane elastic resins, said first layer having a thickness of from about 1 millimeter to about 5 millimeters;

(b) a second layer in contact with said first layer, said second layer having a thickness of from about 5 millimeters to about 70 millimeters and being prepared from a plurality of porous globular lumps comprising a mixture of kaolinite and an expandible material baked at high temperatures, said porous globular lumps being coated with a resin selected from the group consisting of epoxy and urethane elastic resins; and

(c) a third layer in contact with said second layer, said third layer having a thickness of from about 1 millimeter to about 10 millimeters and being prepared from a material selected from the group consisting of (1) cement mortar comprising a mixture of cement, an aggregate selected from the group consisting of kaolinite and glass fibers, and an emulsion selected from the group consisting of natural rubber latex, synthetic rubber latex, and synthetic resins, and (2) kaolinite and a resin selected from the group consisting of epoxy and urethane elastic resins.

4,255,483

FIRE BARRIER COMPOSITIONS AND COMPOSITES

Norman R. Byrd, Villa Park, and John K. Donahoe, Long Beach, both of Calif., assignors to McDonnell Douglas Corporation, Long Beach, Calif.

Filed Jun. 14, 1977, Ser. No. 806,540

Int. Cl.[3] B32B *7/00*

U.S. Cl. 428—245 **17 Claims**

1. A fire resistant composition having low thermal conductivity, comprising a cured mixture of a resin selected from the group consisting of polyimide, epoxy, polybenzimidazole, polyquinoxyline, phenolic and silicone resins; and the reaction product of silicic acid and an anhydride, employing about 10 to about 80 parts of said reaction product per 100 parts of resin solids, by weight.

4,255,484

FABRIC-CONDITIONING COMPOSITION FOR ARTICLE USED TO CONDITION FABRICS IN A CLOTHES DRYER

Frank H. Stevens, St. Charles, Ill., assignor to A. E. Staley Manufacturing Company, Decatur, Ill.

Filed Aug. 29, 1979, Ser. No. 70,600

Int. Cl.[3] D06M *13/00*

U.S. Cl. 428—286 **8 Claims**

4. An improved fabric-conditioner article particularly adapted for use in a clothes dryer comprising, in combination:

a. a fibrous, sheet-like substrate material selected from the group consisting of cellulosic or non-cellulosic sheet materials and combinations thereof;

b. a stiffening material applied to said substrate to impart stiffness and resilience to said substrate at temperatures in the range of 140°–205° F. (60°–96.1° C.) whereby folding of said substrate when said fabric-conditioner article is tumbled with clothes is minimized; and

c. a fabric-conditioner composition carried on said substrate and adapted for transfer to fabrics-commingled therewith, said composition comprising about 60–90% by weight of a cationic quaternary ammonium compound and about 3–40% by weight of nonionic surfactant comprising ethoxylated, propoxylated glycerol and mono- and diesters of hydrogenated tallow acids.

4,255,485

BINDER FOR GLASS FIBER MAT

Ben J. Yau, Reynoldsburg, Ohio, assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Nov. 8, 1979, Ser. No. 92,611
Int. Cl.[3] C08L 3/02; D04H 1/64, 1/74
U.S. Cl. 428—288 13 Claims

1. An aqueous composition suitable for application to glass fibers for bonding said fibers together in a porous mat, said composition comprising:

(a) a phenol-formaldehyde-urea condensate;

(b) starch;

(c) an emulsified thermoplastic resin selected from ethylene-vinylchloride polymers and ethylene-vinylacetate polymers;

(d) a dimer acid; and

(e) an emulsified oil.

11. A porous glass fiber mat comprising randomly matted glass fibers, bonded together with the non-volatile residue of the aqueous composition of claim 1.

4,255,486

METHODS AND MEANS FOR IMPROVINGS RESIN BONDS BETWEEN SUBSTRATES, AND MATERIALS THEREFOR AND PRODUCTS THEREFROM

Oliver W. Burke, Jr., Fort Lauderdale, and Barbara P. Hunt, Pompano Beach, both of Fla., assignors to Marion Darrah and Joseph Y. Houghton, both of Pompano Beach, Fla., co-trustees

Division of Ser. No. 951,040, Oct. 13, 1978, abandoned, which is a division of Ser. No. 754,182, Dec. 29, 1976, Pat. No. 4,131,584, which is a division of Ser. No. 422,777, Dec. 7, 1973, Pat. No. 4,012,350, which is a division of Ser. No. 219,173, Jan. 19, 1972, Pat. No. 3,922,468. This application Oct. 11, 1979, Ser. No. 83,768
Int. Cl.[3] B32B 27/42, 15/00, 9/00
U.S. Cl. 428—356 3 Claims

1. An adhesive material for bonding substrates to one another, said adhesive material consisting essentially of a supported adhesive film made up of

(a) a film support and a dried film carried thereby, said dried film comprising, dry basis by weight, a mixture of

(b) 10 parts of heat curable phenoplast,

(c) 0 to 150 parts of elastomer,

(d) 0 to 50 parts of inorganic material selected from the oxides and hydroxides of the metals calcium, magnesium and zinc, and

(e) 1 to 40 parts of m-aminophenol.

4,255,487

ELECTRICALLY CONDUCTIVE TEXTILE FIBER

John H. Sanders, Newport News, Va., assignor to Badische Corporation, Williamsburg, Va.

Continuation-in-part of Ser. No. 290,937, Sep. 21, 1972, abandoned, which is a continuation-in-part of Ser. No. 271,837, Jul. 14, 1972, Pat. No. 3,823,035. This application May 10, 1977, Ser. No. 795,472
The portion of the term of this patent subsequent to Jul. 9, 1991, has been disclaimed.
Int. Cl.[3] C09C 1/44; D02G 3/00
U.S. Cl. 428—368 5 Claims

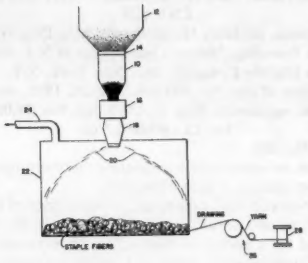
1. An electrically conductive textile fiber comprising a nylon 6 filamentary polymer substrate having finely divided, electrically conductive particles of carbon black suffused through the surface of the filamentary polymer substrate, the electrically conductive particles being present inside the filamentary polymer substrate as a uniformly dispersed phase independent of the phase of the filamentary polymer substrate in an annular region located at the periphery of the filamentary polymer substrate and extending inwardly along the length thereof, the electrically conductive particles being present inside the filamentary polymer substrate in an amount sufficient to render the electrical resistance of the electrically conductive textile fiber not more than about 10^9 ohms/cm.

4,255,488

POLYIMIDE FIBERS

John Gagliani, San Diego, Calif., assignor to International Harvester Company, Chicago, Ill.

Division of Ser. No. 952,738, Oct. 19, 1978. This application Jul. 9, 1979, Ser. No. 55,781
Int. Cl.[3] D02G 3/00
U.S. Cl. 428—398 3 Claims



1. A polyimide fiber in which the polyimide is the reaction product of a diester of a benzophenonetetracarboxylic acid and at least two diamines present in an amount such that the imide forming functionalities are substantially equimolar, one of said diamines being heterocyclic and having nitrogen in the ring, another of said diamines being a para- or meta-substituted aromatic diamine which is free of aliphatic moieties, and any additional diamine being either a heterocyclic or an aromatic diamine as aforesaid, and said fiber having an expanded, microcellular structure.

4,255,489

PERLITE FILLER

Richard B. Nielsen, Los Angeles, Calif., assignor to Grefco, Inc., Bala Cynwyd, Pa.

Division of Ser. No. 886,614, Mar. 14, 1978, Pat. No. 4,183,980, which is a continuation of Ser. No. 734,456, Oct. 21, 1976, abandoned. This application Mar. 12, 1979, Ser. No. 19,576
Int. Cl.[3] C04B 31/22, 31/26
U.S. Cl. 428—405 7 Claims

1. A low density particulate material formed of discrete particles of expanded perlite, said perlite particles each having a coating of a compound that will react to form polydimethylsiloxane, said compound comprising 0.5 to 4.0 weight percent of said particulate material, said coating being formed on said perlite particles by first drying an emulsion of said compound on the individual particles to a moisture content of less than 0.5 weight percent and subsequently heating the dried coated perlite particles for a time such that said filler is rendered substantially resistant to attrition.

4,255,490
OLEFIN-VINYL ALCOHOL-VINYL ACETAL COPOLYMERS, PROCESS FOR PREPARATION THEREOF AND LAMINATE STRUCTURES INCLUDING SAID COPOLYMERS

Tadahiko Katsura, Yokohama, Japan, assignor to Toyo Seikan Kaisha Limited, Tokyo, Japan

Division of Ser. No. 854,007, Nov. 22, 1977. This application Jan. 4, 1979, Ser. No. 901

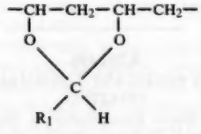
Claims priority, application Japan, Nov. 25, 1976, 51-140749; Nov. 25, 1976, 51-140750

Int. Cl.³ B32B *27/08, 27/32, 27/36, 27/34*

U.S. Cl. 428—483 **11 Claims**

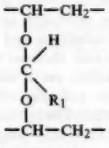
1. A laminated material having excellent hot water resistance, excellent oxygen barrier property and excellent heat sealability in combination, which comprises (i) a layer composed of an olefin-vinyl alcohol-vinyl acetal copolymer and (ii) a layer composed of a heat-sealable resin, said olefin-vinyl alcohol-vinyl acetal copolymer consisting essentially of 10 to 50 mole % of olefin units and 90 to 50 mole % of vinyl units, 50 to 98 mole % of the vinyl units being vinyl alcohol units and 2 to 50 mole % of the vinyl units being at least one kind of vinyl acetal units selected from the group consisting of

(A) units represented by the following formula:



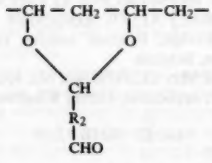
wherein R_1 stands for a hydrogen atom or a monovalent aliphatic, aromatic or aliphatic-aromatic group,

(B) units represented by the following formula:



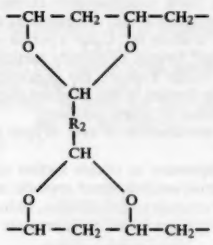
wherein R_1 is as defined above,

(C) units represented by the following formula:



wherein R_2 stands for a direct bond or a divalent aliphatic, aromatic or aliphatic-aromatic group, and

(D) units represented by the following formula:



wherein R_2 is as defined above.

4,255,491
HEAT-SENSITIVE RECORDING PAPER

Akira Igarashi, Fujinomiya, Japan, assignor to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

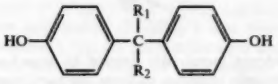
Filed Jul. 17, 1979, Ser. No. 58,401

Claims priority, application Japan, Jul. 18, 1978, 53/87598

Int. Cl.³ B32B *21/04, 21/06*

U.S. Cl. 428—537 **8 Claims**

1. A heat-sensitive recording paper comprising a base paper having a hot water extraction pH of about 6 to 9 having provided thereon a heat-sensitive recording layer containing an electron donating colorless dye and a phenol compound electron accepting acidic material, wherein said phenol compound is a bisphenol compound represented by the formula



wherein R_1 and R_2 each represents a hydrogen atom or an alkyl group containing 1 to 12 carbon atoms or R_1 and R_2 combine to form a carbocyclic ring; or derivatives thereof.

4,255,492
MAGNETIC RECORDING CRYSTALS, PROCESS FOR PRODUCING SAME, AND MAGNETIC RECORDING WEBS USING SAME

Roger G. L. Audran, Vitry-sur-Seine, and Bernard J. Pingaud, Vincennes, both of France, assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation of Ser. No. 230,915, Mar. 1, 1972, abandoned, which is a continuation-in-part of Ser. No. 74,533, Sep. 22, 1970, abandoned. This application Nov. 11, 1974, Ser. No. 522,810

Claims priority, application France, Sep. 25, 1969, 69 32741; Mar. 16, 1971, 71 09090

The portion of the term of this patent subsequent to Dec. 23, 1992, has been disclaimed.

Int. Cl.³ C01G *49/06*

U.S. Cl. 428—694 **25 Claims**

1. Gamma ferric oxide consisting essentially of crystals that have an acicularity ratio of at least 15 and an average crystal length less than 0.5 micron and which comprise alkali metal ions that impart a basicity of at least 0.04 meq. per gram to said oxide.

15. A process for preparing acicular gamma ferric oxide crystals for magnetic recording which comprises

adding under non-oxidizing conditions, at a temperature below about 60° C., an aqueous solution of ferrous salt to an aqueous solution of a stoichiometric excess of an alkaline hydroxide while substantially avoiding local excesses of said ferrous salt, to form an aqueous dispersion of ferrous hydroxide particles, said alkaline hydroxide being

present in said aqueous dispersion in a concentration of at least about a 500% stoichiometric excess;

introducing oxygen into said dispersion at a temperature of about 20° C. to about 60° C. for a period of time sufficient to convert said ferrous hydroxide particles to crystals of alpha ferric oxide hydrate, the concentrations of ferric oxide hydrate formed in the oxidized dispersion being no more than about 15 grams per liter;

discontinuing introduction of said oxygen into said dispersion;

boiling said dispersion to obtain further crystallization of said alpha ferric oxide hydrate crystals; and

subjecting said crystals to dehydration, reduction and oxidation to form gamma ferric oxide crystals.

4,255,493

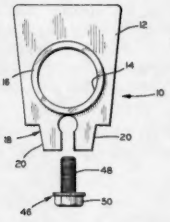
POWDERED METAL PART

Hans Hauser, Bradenton, Fla., assignor to The J. B. Foote Foundry Co., Fredericktown, Ohio

Filed Feb. 12, 1979, Ser. No. 11,367

Int. Cl.³ B22F *7/00*; F16C *35/00*

U.S. Cl. 428—546 **5 Claims**



1. A powdered metal part formed by punches and a die which are brought together to form the part from powdered metal under high pressure, said part having a recess therein with at least one side open at a first surface of the part and an end open at another surface of the part which is transversely disposed with respect to the first surface, said recess having generally parallel side walls, said side walls having serrations including generally V-shaped ridges and generally V-shaped grooves which are straight and are parallel to the direction in which the punches and die are brought together, the V-shaped ridges on one side wall being aligned with the V-shaped grooves on the other side wall, said ridges and grooves being effective to receive a threaded member turned into the recess between the side walls from the open end of the recess.

4. A powdered metal part having two opposite, formed surfaces, said part having an elongate notch extending between the surfaces and having an open end at another surface, said notch having generally parallel side walls, said side walls having serrations including straight V-shaped ridges and straight V-shaped grooves with the V-shaped ridges on one side wall being aligned with the V-shaped grooves on the other side wall, all of said ridges and grooves being parallel and effective to threadedly receive a screw turned into the notch between the side walls from the open end of the notch.

4,255,494

SINTERED FERROMAGNETIC POWDER METAL PARTS FOR ALTERNATING CURRENT APPLICATIONS

Orville W. Reen, New Kensington, and Merlin L. Osborn, Saxonburg, both of Pa., assignors to Allegheny Ludlum Steel Corporation, Pittsburgh, Pa.

Filed Apr. 25, 1979, Ser. No. 33,288

Int. Cl.³ H01H *85/16*; H02K *15/12*

U.S. Cl. 428—551 **10 Claims**

1. A method of making a metal core for alternating current applications from ferromagnetic powder, comprising

pressing a ferromagnetic powder into a cross section of the core, with the thickness of the cross section approaching that below which the green density is no longer uniform throughout the volume of the part,

pressing sufficient additional ferromagnetic powder metal cross sections to meet an overall core thickness requirement when the individual cross sections are subsequently stacked,

stacking the individual cross sections with the cross sectional faces of adjacent parts in noncontacting relationship, and

sintering the cross sections.

10. A ferromagnetic powder metal core for alternating current applications said core consisting of a plurality of core cross sections, each cross section having a fixed cross sectional dimension, with the sections arranged such that the faces of adjacent parts are stacked in vertical alignment in noncontacting relationship, said core produced by

pressing a ferromagnetic powder into a cross section of the core, with the thickness of the cross section approaching that below which the green density is no longer uniform throughout the volume of the part,

pressing sufficient magnetic powder metal cross sections to meet the overall core thickness requirement when the cross sections are subsequently stacked in vertical alignment with all individual cross sections of substantially equal thickness of at least 0.008 inch,

assembling the individual cross sections in vertical alignment with the cross sectional faces of adjacent parts in noncontacting relationship, and

sintering the cross sections.

4,255,495

CORROSION RESISTANT THERMAL BARRIER COATING

Stanley R. Levine, Rocky River; Robert A. Miller, Strongsville, and Philip E. Hodge, Oakwood Village, all of Ohio, assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Oct. 31, 1979, Ser. No. 89,779

Int. Cl.³ B32B *15/04*

U.S. Cl. 428—632 **12 Claims**

1. A thermal barrier coating system for protecting the surface of a metal substrate in a hot corrosive gas comprising

a metal alloy bond coating containing a metal selected from the group consisting of nickel, cobalt, and iron covering said surface of said substrate, and

a corrosion-resistant oxide thermal barrier coating containing at least one alkaline earth silicate selected from the group consisting of calcium silicate in the range of $1.8CaO{:}1SiO_2$ to $3CaO{:}1SiO_2$, magnesium silicate in the range of $1.8MgO{:}1SiO_2$ and $3MgO{:}1SiO_2$, and calcium silicate in the range of $1.8CaO{:}1SiO_2$ and $3CaO{:}1SiO_2$ covering said bond coating.

12. A thermal barrier coating system as claimed in claim **1** wherein the corrosion-resistant oxide thermal barrier coating contains up to 50% by weight of free silica.

4,255,496

STEEL WIRE REINFORCING ELEMENTS WITH A BRASS-COBALT ALLOY ADHESIVE COATING

Guy Haemers, Deerlijk, Belgium, assignor to N. V. Bekaert S.A., Zwevegem, Belgium

Filed May 21, 1979, Ser. No. 40,902

Claims priority, application United Kingdom, May 26, 1978, 23062/78

Int. Cl.³ B32B *15/00*

U.S. Cl. 428—677 **8 Claims**

1. A steel wire element for use in the reinforcement of rubber compositions wherein the steel wire is provided with an adhesive coating comprising a brass alloy containing about 58% to 75% of copper and about 0.5 to 10% of cobalt to improve the

adhesion between the coated steel wire and said rubber composition.

4,255,497

FERRITIC STAINLESS STEEL

Armand P. Bond, Livonia; Anthony J. Bryhan, Ann Arbor, both of Mich., and James D. Redmond, Pittsburgh, Pa., assignors to Amax Inc., Greenwich, Conn.

Filed Jun. 28, 1979, Ser. No. 53,149
Int. Cl.[3] C22C *38/06*; B32B *15/18*
U.S. Cl. 428—685 24 Claims

1. A ferritic stainless steel, characterized by improved impact properties, which consists essentially of between about 21% and about 30% chromium, up to about 5% molybdenum, between about 2% and 4.5% nickel, between about 0.1% and about 0.4% niobium, between about 0.2% and about 0.75% aluminum, up to about 0.025% carbon, up to about 0.035% nitrogen and the balance essentially iron and incidental impurities with a niobium to carbon weight ratio of less than about 10:1.

11. A ferritic stainless steel, characterized by improved impact properties, which consists essentially of between about 24% and about 28% chromium, between about 2% and about 5% molybdenum, between about 2% and about 4.5% nickel, up to about 0.025% carbon, up to about 0.035% nitrogen, between about 0.1% and about 0.3% niobium, between about 0.2% and about 0.5% aluminum, and the balance essentially iron and incidental impurities with a niobium to carbon weight ratio of less than about 10:1.

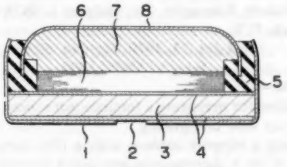
16. An article comprising at least one standard sheet of ferritic stainless steel, characterized by improved impact properties, which consists essentially of between about 21% and 30% chromium, up to about 5% molybdenum, between about 2% and about 4.5% nickel, between about 0.1 and about 0.4% niobium, between about 0.2% and about 0.75% aluminum up to about 0.025% carbon, up to about 0.035% nitrogen and the balance essentially iron and incidental impurities with a niobium to carbon weight ratio of less than about 10:1.

4,255,498

BUTTON-TYPE AIR CELL

Kazumasa Yoshida, Yokohama, Japan, assignor to Toshiba Ray-O-Vac Co., Ltd., Tokyo, Japan

Filed Oct. 26, 1979, Ser. No. 88,620
Int. Cl.[3] H01M *12/06*
U.S. Cl. 429—27 11 Claims



1. An improved button-type air cell comprising an anode, an air cathode, and a viscous gelled electrolyte interposed between and in contact with said anode and said air cathode, the improvement comprising

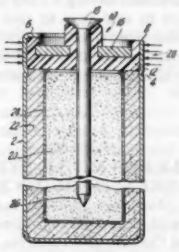
said air cathode comprising a binder containing powdered carbon particles mixed with a metal chelate, said metal chelate being selected from the group consisting of metal phthalocyanines and metal porphyrins wherein the said metal atom is selected from the group consisting of cobalt, iron, nickel, manganese and copper and is symmetrically surrounded by four nitrogen atoms, said metal chelates containing from one to four groups of the formula $-SO_3X$ wherein X is selected from the group consisting of hydrogen, sodium, potassium, lithium and ammonium.

4,255,499

HIGH PRESSURE SAFETY VENT FOR GALVANIC DRY CELLS

Theodore R. Beatty, Bay Village, Ohio, assignor to Union Carbide Corporation, New York, N.Y.

Filed Mar. 14, 1980, Ser. No. 130,262
Int. Cl.[3] H01M *2/12*
U.S. Cl. 429—54 6 Claims



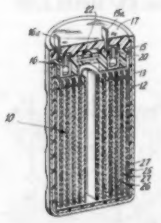
1. In a cylindrical galvanic cell comprising a container having an open end and an inner disposed active anode, active cathode, and electrolyte disposed within said container; a closure means for the container, said closure means comprising an annular cover disposed within an annular di-electric gasket having a U-shaped type cross section with the center of the gasket defining an opening; a current collector disposed through the central opening in the gasket and contacting the inner active member of the cell; and said container having an annular segment of its upper wall radially compressed against said cover via said gasket providing a seal thereat; the improvement wherein a first arc portion between about 150° and 190° of the top peripheral edge of the container defining an open end is curled over the gasket thereby further securing the closure means to the container along said first arc portion so as to enable a predetermined pressure buildup within the cell to tip the closure means thereby producing a vent passage between the closure means and the container proximal the remaining second arc portion of the top peripheral edge of the container while said closure means remains retained by said first arc portion.

4,255,500

VIBRATION RESISTANT ELECTROCHEMICAL CELL HAVING DEFORMED CASING AND METHOD OF MAKING SAME

John W. Hooke, Gainesville, Fla., assignor to General Electric Company, Gainesville, Fla.

Filed Mar. 29, 1979, Ser. No. 25,060
Int. Cl.[3] H01M *6/10*
U.S. Cl. 429—94 4 Claims



1. In a vibration resistant electrochemical cell including an electrode assembly of spirally wound plate electrodes having at least one end terminating among the outer convolutions of the electrode assembly, and further having internal terminal

connections at predetermined locations relative to said end the improvement comprising the combination of:

radially asymmetric external terminals associated with said internal terminal connections, and

a tubular case of deformable material receiving said electrode assembly and having inwardly directed deformed wall portions firmly engaging said electrode assembly and restraining it against movement within the case,

said external terminals having a fixed circumferential orientation relative to said case so that said deformed wall portions are displaced from said electrode terminal and by a known amount sufficient to avoid the exertion of damaging mechanical stress upon the assembly at said terminal end.

4,255,501

INTERNALLY REFLECTIVE, DYE SENSITIZED, WET-TYPE PHOTOCELL

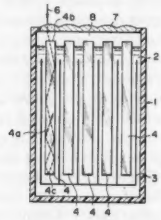
Tetsuo Osa, and Masamichi Fujihira, both of Sendai, Japan, assignors to President of Tohoku University, Miyagi, Japan

Filed Oct. 25, 1979, Ser. No. 87,945

Claims priority, application Japan, Oct. 31, 1978, 53-134750

Int. Cl.³ H01M *6/30, 6/36*

U.S. Cl. 429—111 **5 Claims**



1. An internally reflective, dye sensitized, wet-type photocell equipped with anodes and cathodes which are immersed in an electrolyte solution containing a reduction-oxidation agent and a dye sensitizer, each of said anodes comprising an optically transparent member having a light inlet end adapted to allow the entry of light into the interior of the anode, and a thin film-like surface layer of an n-type semiconductive substance adapted to absorb the light and to generate electricity by reflecting the light entered through the light inlet end a plurality of times within said anode.

4,255,502

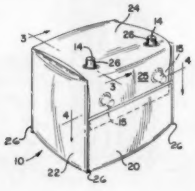
COVER FOR AUTOMOBILE BATTERIES

Milton E. Taylor, III, Chicago, Ill., assignor to Michael D. Taylor, Chicago, Ill.

Filed Sep. 7, 1979, Ser. No. 73,259

Int. Cl.³ H01M *2/00*

U.S. Cl. 429—163 **7 Claims**



1. A battery jacket for providing a self-supporting receptacle adapted to receive an automotive battery having terminals and insulate and protect the battery from extreme cold and wind, the improvement comprising:

a self-supporting, outer cover;

said cover comprising a front, back, hinged top and sides;

bottom means joining said front, back and sides;

first seam means joining the front and said side walls;

second seam means joining the back and said side walls;

said first and second seam means disposed to extend upwardly from the bottom means and form skeletonized rigidifying means to permit said cover to be self-supporting;

said cover comprising an inner layer of material and an outer layer of material and forming therebetween pocket means;

insulating means located within said pocket means.

4,255,503

GALVANIC ELEMENT WITH NEGATIVE ZINC ELECTRODE

Margarete Jung, Kelkheim, Taunus, Fed. Rep. of Germany, assignor to Varta Batterie, A.G., Am Leineufer, Fed. Rep. of Germany

Filed Feb. 2, 1979, Ser. No. 9,118

Claims priority, application Fed. Rep. of Germany, Feb. 24, 1978, 2807980

Int. Cl.³ H01M *6/04*

U.S. Cl. 429—201 **9 Claims**

1. In a galvanic element having a negative zinc electrode and a positive electrode in contact with an aqueous strongly alkaline electrolyte and in which the zinc electrode is subject to passivation on discharge of said galvanic element, the improvement which comprises incorporating in at least one of said electrolyte and negative and positive electrodes at least one additive selected from the group consisting of the soluble chlorides and sulfates and mixtures thereof, the electrolyte containing said additive in an amount in the range from close to saturation to the supersaturation region.

2. In a galvanic element having a negative zinc electrode and a positive electrode in contact with an aqueous strongly alkaline electrolyte and in which the zinc electrode is subject to passivation on discharge of said galvanic element, the improvement which comprises incorporating in at least one of said electrolyte and negative and positive electrodes at least one additive selected from the group consisting of the soluble chlorides and sulfates and mixtures thereof, the electrolyte containing said additive in an amount exceeding the saturation level by about 0.05 to about 10% by weight of said electrolyte.

4,255,504

METHOD FOR PRODUCING CRT SCREEN STRUCTURE

David F. Hakala, Lancaster, Pa., assignor to RCA Corporation, New York, N.Y.

Filed Jul. 23, 1979, Ser. No. 60,030

Int. Cl.³ G03C *5/00*

U.S. Cl. 430—28 **10 Claims**

1. A method for preparing a luminescent screen structure for a cathode-ray tube comprising

(a) coating a support surface with a film consisting essentially of (i) a dichromatic sensitized polymeric material whose solubility is altered when it is exposed to radiant energy, (ii) at least one member of a first group consisting of diol alkanes and diol ethers, (iii) and at least one member of a second group consisting of fluorescein and fluorescein salts,

(b) exposing said film to an image in the form of radiant energy until the solubility of the irradiated regions thereof is selectively altered, thereby producing in said film regions of greater solubility regions of lesser solubility,

(c) and removing those regions of said film with greater solubility,

(d) coating now bare areas of said support surface and said retained film regions with a composition containing particles of screen-structure material,

(e) and then removing at least a portion of said retained film regions and the overcoating composition thereon, while

retaining the overcoating composition coated on said support surface while retaining those regions of said film of lesser solubility.

4,255,505

ELECTROPHOTOGRAPHIC PROCESS USING LAYERED ELEMENT CONTAINING P-TYPE OR N-TYPE MATERIALS, WITH MULTIPLE CHARGING STEPS AND BLANKET IRRADIATION

Hiroshi Hanada, Yokohama; Nobuo Kitajima, Akishima, and Tatsuo Masaki, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 755,026, Dec. 29, 1976, abandoned, which is a continuation of Ser. No. 419,043, Nov. 26, 1973, abandoned, which is a continuation of Ser. No. 87,425, Nov. 6, 1970, abandoned. This application Jul. 31, 1978, Ser. No. 929,242

Claims priority, application Japan, Nov. 11, 1969, 44-90312; Nov. 17, 1969, 44-92335; Nov. 27, 1969, 44-95296

Int. Cl.³ G03G *5/14, 13/22*

U.S. Cl. 430—31 **4 Claims**

1. An electrophotographic process for forming a latent image comprising the steps of applying a primary charge to an electrophotographic photosensitive member comprising an electrically conductive base layer, an intermediate layer superposed on said conductive base layer, a layer of photoconductive material superposed on and having a thickness greater than said intermediate layer and an insulating layer superposed on said photoconductive layer, said primary charging step being performed by applying a negative charge to said insulating layer when said photoconductive layer comprises a p-type material and by applying a positive charge to said insulating layer when said photoconductive layer comprises an n-type material so that an electrical charge from said base is bound at the interface of said photoconductive layer and said insulating layer; subjecting said photosensitive member to corona charging of a polarity opposite to that of the primary charge or to AC discharging contemporaneously with imagewise exposure; and then subjecting said photosensitive member to blanket irradiation to increase the electrostatic contrast and form an electrostatic latent image of high contrast on said insulating layer;

wherein said intermediate layer has a greater p-type concentration than said photoconductive layer when said photoconductive layer comprises an p-type material, and a greater n-type concentration than said photoconductive layer when said photoconductive layer comprises an n-type material, to facilitate the injection of an electric charge from said base to said photoconductive layer.

4,255,506

ELECTROPHORETIC MIGRATION IMAGING DISPERSION

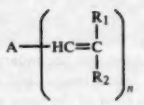
James A. Van Allan; Louis J. Rossi, both of Rochester; Melvin S. Bloom, Penfield; Michael T. Regan, Fairport; Hal E. Wright, and Joseph Y. Kaukeinen, both of Rochester, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Division of Ser. No. 889,715, Mar. 24, 1978, Pat. No. 4,165,984, which is a continuation-in-part of Ser. No. 804,042, Jun. 6, 1977, abandoned. This application Apr. 23, 1979, Ser. No. 32,313

Int. Cl.³ G03G *13/24*

U.S. Cl. 430—41 **5 Claims**

1. An electrophoretic migration imaging dispersion comprising an electrically insulating carrier, a charge control agent and an electrically photosensitive material having the following structure:



wherein

n equal 1 or 2;

A represents phenylene, napthylene, anthracenyl, anthracenediyl, and dibenzothien-diyl;

R_1 and R_2, which may be the same or different when taken along, represent hydrogen, cyano, alkylcarbonyl and arylcarbamoyl, arylcarbonyl, cyanoaryl;

R_1 and R_2, when taken together, represent sufficient atoms to form substituted and unsubstituted radicals selected from the group consisting of furanylidene, fluorenylidene, pyrimidinylidene, thiazolidinylidene, pyrrolinyl, indenyl, isoxazolinylidene, pyrazolinylidene and indanylidene, wherein said substituents are selected from the group consisting of hydrogen, cyano, aryl, oxo, thioxo, nitro, alkyl, nitroaryl, carbamoyl and cyanoalkyl;

alkyl, represents an alkyl group having from one to six carbon atoms;

aryl, represents an aromatic nucleus selected from the group consisting of benzene, napthalene or anthracene; except that when:

(A) A represents an anthracene nucleus and

(i) R_1 and R_2 when taken together represent 1,3,-5-trihydro-2,4,6-trioxo-pyrimidin-5-ylidene; 3-cyano-4-phenyl-2-oxopyrrolin-5-ylidene; or 3-carboxyinden-1-ylidene; or

(ii) R_1 taken alone represents cyano and R_2 represents methyl sulfonyl, phenylcarbamoyl or ethoxycarbonyl; or

(iii) either R_1 or R_2 is alkylcarbonyl or phenylcarbonyl; then n represents 2; or

(B) A represents a phenylene nucleus and R_1 and R_2 taken together represent 4,5-dicyano-1,3-dithio-2-ylidene, then n represents 2; or

(C) R_1 is hydrogen, R_2 must be other than hydrogen.

4,255,507

ELECTROPHOTOGRAPHIC SCREEN PROCESS

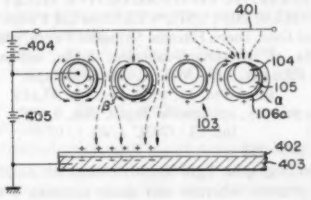
Katsunobu Ohara; Keiji Tanaka, both of Kawasaki; Yujiro Ando, Yokohama, and Inao Moriyama, Ebina, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 771,309, Feb. 23, 1977, which is a continuation of Ser. No. 480,280, Jun. 17, 1974, abandoned. This application Feb. 21, 1978, Ser. No. 879,505

Claims priority, application Japan, Jun. 19, 1973, 48-69343; Aug. 1, 1973, 48-87068; Aug. 1, 1973, 48-87069; Aug. 1, 1973, 48-87070; Nov. 2, 1973, 48-123670; Jan. 29, 1974, 49-12412

Int. Cl.³ G03G *13/00*

U.S. Cl. 430—53 **4 Claims**



1. An electrophotographic process for use with a photosensitive screen having a number of openings therein, said process comprising the steps of applying a voltage to the screen, apply-

ing an image light to said screen to form a primary electrostatic latent image thereon, applying ion flow through the screen from a corona source onto a chargeable member to form a secondary latent image thereon, repeating the ion flow application step to form subsequent secondary images by a single primary electrostatic latent image, and a preliminary step of applying a corona ion flow of the same polarity as the corona ion source and prior to said secondary latent image formation to stabilize the condition of the primary electrostatic latent image.

4,255,508

FLEXIBLE METAL PRINTING CYLINDER HAVING A COATING OF CRYSTALLINE PHOTOCONDUCTIVE MATERIAL

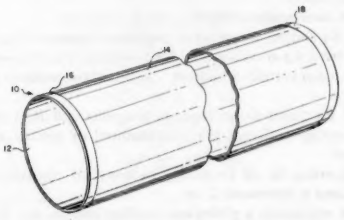
Manfred R. Kuehnle, Lexington, Mass., assignor to Coulter Systems Corporation, Bedford, Mass.

Filed Dec. 27, 1977, Ser. No. 864,377

The portion of the term of this patent subsequent to May 24, 1994, has been disclaimed.

Int. Cl.[3] **G03G** *5/082, 13/28*

U.S. Cl. 430—94 **10 Claims**



1. A printing cylinder which comprises a thin-walled metal sleeve having a thickness of the order of a fraction of a millimeter and being flexible but capable of being rigidly maintained in cylindrical configuration for printing and having a thin film photoconductive coating bonded thereto, the coating being flexible, microcrystalline, wholly inorganic, having a dark resistivity of at least 10^{12} ohm centimeters and a ratio of dark to light resistivity of at least 10^4, having a thickness which is at most of the order of a micron, being electrically anisotropic and being capable of being charged and retaining the charge sufficiently to enable imaging at high speed.

4,255,509

PHOTOGRAPHIC LIGHT-SENSITIVE SHEET FOR THE COLOR DIFFUSION TRANSFER PROCESS

Shigetoshi Ono; Tooru Harada; Shinsaku Fujita, and Yoshinobu Yoshida, all of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

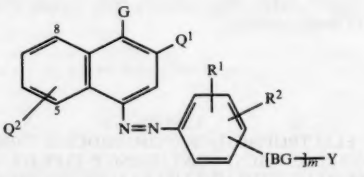
Filed Jun. 11, 1979, Ser. No. 47,619

Claims priority, application Japan, Jun. 9, 1978, 53-69488

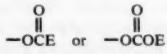
Int. Cl.[3] **G03C** *1/40, 1/10*

U.S. Cl. 430—216 **26 Claims**

1. A photographic light-sensitive sheet for a color diffusion transfer process wherein said sheet contains a neutralizing layer containing unreacted acrylate or acrylic acid, and said sheet comprises a support having thereon at least one light-sensitive silver halide emulsion layer having associate therewith a compound represented by the following general formula:



wherein Q^1 represents a hydrogen atom; a halogen atom; a sulfamoyl group represented by the formula $—SO_2NR^3R^4$ wherein R^3 represents a hydrogen atom or an alkyl group, R^4 represents a hydrogen atom or R^{4a} wherein R^{4a} represents an alkyl group, an aralkyl group or phenyl group, and R^3 and R^4 may combine directly or through an oxygen atom to form a ring; a group represented by the formula $—SO_2R^5$ wherein R^5 represents an alkyl group or an aralkyl group; a carboxy group; a group represented by the formula $—COOR^6$ wherein R^6 represents an alkyl group or a phenyl group; or a group represented by the formula $—CONR^3R^4$ wherein R^3 and R^4 each has the same meaning as defined above; Q^2 is positioned at the 5- or the 8-position to the G group and represents a hydroxy group, a group represented by the formula $NHCOR^{4a}$ or a group represented by the formula $—NHSO_2R^{4a}$ wherein R^{4a} has the same meaning as defined above; R^1 and R^2, which may be the same or different, each represents a methyl group, or a methoxy group; BG represents a bridging group; m represents 0 or 1; Y represents a redox center which functions to release a diffusible dye as a result of self cleavage upon oxidation, Y being ballasted; and G represents a hydroxyl group, a salt thereof, or a hydrolyzable acyloxy group represented by the formula



wherein E represents an alkyl group or an aryl group.

24. A color diffusion transfer film unit comprising a support, the light-sensitive element of claim **1**, an image receiving element, a processing element containing a developing agent in a rupturable container constructed such that by passing the film unit through a pair of juxtaposed pressure-applying members, said processing element is ruptured and dye images are formed in said image-receiving element.

4,255,510

DEVELOPMENT RESTRAINER PRECURSORS FOR PHOTOGRAPHIC ELEMENTS

Michael J. Simons, Eastcote; David T. Southby, West Harrow, both of England, and Hans G. Ling, Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Oct. 18, 1979, Ser. No. 85,944

Claims priority, application United Kingdom, Oct. 20, 1978, 41437/78

Int. Cl.[3] **G03C** *1/40, 7/00, 1/10, 5/30*

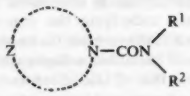
U.S. Cl. 430—219 **33 Claims**

12. In a photographic assemblage to be processed by an alkaline processing composition, said assemblage comprising:

(a) a photographic element comprising a support having thereon at least one photosensitive silver halide emulsion layer having associated therewith a dye image-providing material; and

(b) a dye image-receiving layer;

the improvement wherein said assemblage contains a development restrainer azole compound having an alkali-hydrolyzable, N,N-disubstituted carbamoyl group, said compound having the following formula:



wherein:

R^1 and R^2 each represent a substituted or unsubstituted alicyclic, aliphatic, aromatic or heterocyclic moiety, or may be taken together with the nitrogen to which they are attached to form a heterocyclic ring; and

Z represents the atoms necessary to complete an azole ring containing at least two nitrogen atoms.

4,255,511

DIRECT POSITIVE SILVER HALIDE LIGHT-SENSITIVE MATERIAL

Shigeo Hirano; Keiichi Adachi, and Nobuyuki Tsujino, all of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Ashigara, Japan

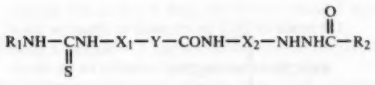
Filed Apr. 4, 1979, Ser. No. 26,962

Claims priority, application Japan, Apr. 6, 1978, 53/40621

Int. Cl.[3] G03C *1/06, 7/00, 1/76, 1/36*

U.S. Cl. 430—217 **37 Claims**

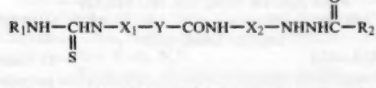
1. A direct positive silver halide photographic light-sensitive material comprising a support having coated thereon an unfogged internal latent image light-sensitive silver halide photographic emulsion layer and a hydrophilic colloid layer contiguous to said emulsion layer, at least one of said layers containing a compound represented by the formula (1)



(I)

wherein R_1 represents an alkyl group, an alkenyl group, a phenylene group or a naphthyl group; R_2 represents a hydrogen atom, an alkyl group, an alkenyl group, a phenylene group or a naphthyl group; X_1 and X_2, which may be the same or different, each represents a phenylene group or naphthylene group; and Y represents —R—, —O—R— or —S—R— wherein R represents an alkylene group and the O or S is bonded to X_1.

18. In a light-sensitive material for the diffusion transfer process comprising a light-sensitive element, an image receiving element and a processing element, the improvement which comprises: said light-sensitive element comprising a direct positive unfogged internal latent image light-sensitive silver halide emulsion layer and a hydrophilic colloid layer contiguous to said emulsion layer, at least one of said layers containing a compound represented by the formula (I):



(I)

wherein R_1 represents an alkyl group, an alkenyl group, a phenylene group or a naphthyl group; R_2 represents a hydrogen atom, an alkyl group, an alkenyl group, a phenylene group or a naphthyl group; X_1 and X_1, which may be the same or different, each represents a phenylene group or naphthylene group; and Y represents —R—, —O—R— or —S—R— wherein R represents an alkylene group and the O or S is bonded to X.

4,255,512

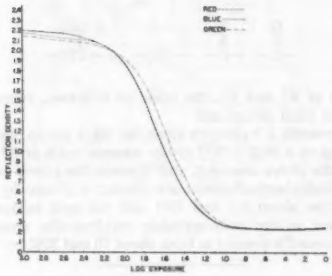
PHOTOGRAPHIC PROCESSES AND PRODUCTS

George H. Nawn, Westwood, and Donald O. Rickter, Arlington, both of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

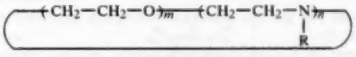
Filed Dec. 26, 1979, Ser. No. 106,754

Int. Cl.[3] G03C *1/40, 5/54, 7/00, 5/30*

U.S. Cl. 430—219 **27 Claims**



15. A photographic product for use in forming a multicolor diffusion transfer image comprising a photosensitive element comprising a support carrying a blue-sensitive silver halide emulsion having a yellow dye developer associated therewith, a green-sensitive silver halide emulsion having a magenta dye developer associated therewith and a red-sensitive silver halide emulsion having a cyan dye developer associated therewith, a second sheet-like element positioned in superposed or superposable relationship with said photosensitive element, an image receiving layer positioned in one of said elements, a rupturable container releasably holding an aqueous alkaline processing composition adapted, when distributed between a pair of predetermined layers carried by said photosensitive element and said second element to develop said silver halide emulsions and provide a multicolor diffusion transfer image on said image-receiving layer, said product including a ligand represented by the formula



wherein R is hydrogen, alkyl or hydroxyalkyl; m is an integer of from 3 to 10 and n is O or an integer of from 1 to 3 with the proviso that the sum of m and n is not greater than 10.

4,255,513

PHOTOPOLYMERIZABLE RECORDING MATERIALS

Urbain L. Laridon, Wilrijk; August M. Mariën, Oevel; Walter F. De Winter, s'-Gravenwezel, and Hendrik E. Kokelenberg, Merksem, all of Belgium, assignors to AGFA-GEVAERT N.V., Mortsel, Belgium

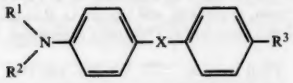
Filed Aug. 8, 1979, Ser. No. 64,895

Claims priority, application United Kingdom, Aug. 25, 1978, 34738/78

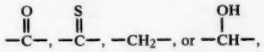
Int. Cl.[3] G03C *1/68*

U.S. Cl. 430—281 **13 Claims**

1. A photosensitive element which comprises a base having thereon a solid photosensitive layer wherein said layer comprises as essential materials at least one polymerisable ethylenically unsaturated organic compound and a photopolymerisation initiating mixture consisting essentially of an oxime ester photopolymerisation initiator and a p-dialkylamino benzene corresponding to the general formula (I):



wherein:
X represents



each of R^1 and R^2, the same or different, represents a lower alkyl group, and
R^3 represents a hydrogen atom, an alkyl group, an alkoxy group or a $N(R^1)(R^2)$ group wherein each of R^1 and R^2 has the above meaning, and wherein the oxime ester and the dialkylaminobenzene are present in a ratio by weight of from about 1:1 and 10:1 and the said mixture with respect to the polymerisable ethylenically unsaturated compound is present at from about 10 and 50% by weight.

4,255,514

METHOD FOR FABRICATING A DIFFRACTIVE SUBTRACTIVE FILTER EMBOSSING MASTER

James Kane, Zumikon, Switzerland, assignor to RCA Corporation, New York, N.Y.

Filed Apr. 27, 1979, Ser. No. 33,828
Int. Cl.³ G03C *5/04*
U.S. Cl. 430—320 **4 Claims**

1. In a method employing a recording blank for fabricating a master to be used in embossing a diffractive subtractive filter, representing certain picture-image information defined by a spatial arrangement of contiguous white-manifesting regions and non-white manifesting regions, into a thermoplastic film, said recording blank comprising a substrate having a given metal surface thereof formed of at least one set of spaced line ridges defining a diffraction grating of a given profile and depth, said given surface having a photoresist disposed thereon which fills the spaces between adjacent line ridges and provides a substantially smooth exterior surface; said method including the steps of exposing said exterior surface of said photoresist to light manifesting said certain picture-image information, removing exposed photoresist from solely said white-manifesting regions thereby to reveal entirely spaced line ridges of only portions of said surface of said substrate underlying said white-manifesting regions, electroplating a predetermined metal onto said revealed portions of said given metal surface for leveling solely said revealed portions of said given metal surface to obliterate the revealed spaced line ridges of said white-manifesting portions, and then removing all the remaining photoresist to now reveal line ridges of said given metal surface underlying the non-white manifesting regions of said exposed photoresist; the improvement wherein;
said predetermined metal has a flow-melt temperature substantially below that of said given metal surface of said substrate, and wherein said improved method includes the additional step of;
heating said electroplated predetermined metal to a given temperature at least equal to its flow-melt temperature but below the flow-melt temperature of said given metal surface.

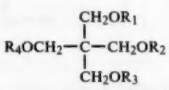
4,255,515

PHOTOGRAPHIC FILMS

Toshiaki Shibue; Koichi Nagayasu; Masayoshi Mayama; Masao Ishihara, and Naoto Abe, all of Hino, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Nov. 13, 1978, Ser. No. 959,592
Claims priority, application Japan, Nov. 19, 1977, 52-139246
Int. Cl.³ G03C *1/78*
U.S. Cl. 430—495 **13 Claims**

1. A photographic film which comprises (A) a support having two sides, (B) at least one light-sensitive silver halide emulsion layer on one side of said support (A), and, (C), at least one layer containing a compound represented by formula I and a hydrophobic polymer (first layer) and at least one layer containing an antistatic agent (second layer), said first and second layers being placed on the other side of said support (A) and said first layer being placed closer to said support (A) than said second layer:


formula I

wherein, R_1 represents a carboxylic acid residue having from 12 to 24 carbon atoms and R_2, R_3 and R_4 represent independently hydrogen atoms or organic acid residues having from 1 to 24 carbon atoms.

4,255,516

PHOTOGRAPHIC SUPPORT CONTAINING DIFFERENT POLYESTER LAYERS

Kazunobu Katoh, Minami-Achigara; Saburo Fujita, Otsu; Toshihiro Otaki, Otsu, and Shozi Nakashima, Otsu, all of Japan, assignors to Fuji Photo Film Co., Ltd. and Toray Industries, Inc., both of, Japan

Filed Apr. 18, 1980, Ser. No. 141,529
Claims priority, application Japan, Apr. 23, 1979, 54-50705
Int. Cl.³ G03C *1/78*
U.S. Cl. 430—533 **17 Claims**

1. A photographic support comprising a composite polyester film having an inner layer of polyester containing volatile diffusible substances or exudative substances, and having covering layers on both sides thereof formed of a different type of polyester substantially free of adverse amounts of such volatile diffusible and exudative substances and having a glass transition temperature equal to or higher than that of the inner layer, said composite film being oriented along at least one prescribed axis.

4,255,517
LYSOZYME ASSAY

Larry C. Ford, 3278 Sawtelle Blvd., #3, Los Angeles, Calif. 90066

Continuation-in-part of Ser. No. 943,773, Sep. 20, 1978, abandoned. This application Feb. 2, 1979, Ser. No. 9,379

Int. Cl.³ C12Q *1/34*

U.S. Cl. 435—18 **22 Claims**

1. A method of determining the integrity of amniochorial membranes which comprises:

collecting a sample of at least about one μl of vaginal fluid;

placing said vaginal fluid sample in a concentrated area on the surface of a test plate wherein said test plate contains an agarose gel including within the gel a bactericidal agent and a suspension of killed Micrococcus lysodiekticus in a buffer containing an organic radical wherein the concentration of said buffer is from about 0.001 M to about 0.5 M and of an ionic strength which is of a strength sufficient such that said vaginal fluid sample dilutes the ionic strength of the point of contact of said vaginal fluid sample on the surface of said agarose gel to from about 0.05 to about 0.1;

placing a standard quantity of a fluid containing a known concentration of a lysozyme on a second point on the surface of said agarose gel;

incubating said test plate at about 37° C. from 20 minutes to 60 minutes;

and comparing the size of the zone of lysis of said vaginal fluid sample with the size of the zone of lysis of said sample of lysozyme.

15. A process for detecting and quantifying the content of the enzyme lysozyme in biological fluids which comprises:

placing a sample of said biological fluids on a test plate wherein said test plate contains from about 0.05 percent to about 5 percent agarose, from about 0.03 to about 0.5 percent killed *Micrococcus lysodiekticus*, from about 0.05 percent to about 0.1 percent bactericidal agent, in from about 0.01 M to about 0.5 M buffer containing an organic radical whose pH is from about 6 to about 7 and whose ionic strength is from about 0.05 to about 0.1;

placing a sample of a known concentration of purified lysozyme on an adjacent area on said test plate;

incubating said test plate at from about 25° C. to about 40° C. for about 20 minutes to about 60 minutes;

comparing the zone of lysis of said biological sample with the zone of lysis of said lysozyme sample.

20. A method of determining the maturity of fetal lumgs of an unborn fetus which comprises:

collecting a sample of amniotic fluid;

assaying said sample of amniotic fluid by using an assay procedure wherein the zone of lysis of a bactericidal cell is measured on a test plate, said plate containing a buffer having an organic radical in an amount sufficient to maintain the pH within a range suitable for cell lysis, to determine if the zone of lysis of the sample within one hour is greater than or less than the zone of lysis produced by a known sample of lysozyme having a concentration of 12 μg per ml.

4,255,518
PROCESS FOR THE RECOVERY OF STARCH FROM CEREAL GRAINS AS AN AQUEOUS SLURRY

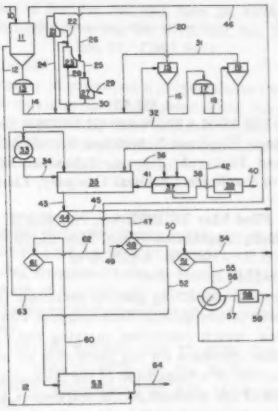
Werner C. Muller, Dobbs Ferry, N.Y., and Franklyn D. Miller, Cincinnati, Ohio, assignors to National Distillers and Chemical Corp., New York, N.Y.

Filed Aug. 27, 1979, Ser. No. 69,950

Int. Cl.³ C13L *1/00*; C12P *7/06*

U.S. Cl. 435—161 **8 Claims**

1. In a process for wet milling cereal grain for the recovery of starch therefrom in which the cereal grain is soaked in steepwater to provide softened grain kernels, the softened grain kernels are coarsely milled to separate the germ from the bran, gluten and starch components thereof and germ free starch is recovered as an aqueous slurry with or without prior separation and recovery of bran and/or gluten, the improvement which comprises recovering the steepwater substantially free from softened grain kernels which contains dissolved components of the cereal grain, utilizing the recovered steepwater as process water for one or more steps of the wet milling



process prior to recovery of the starch slurry, and recycling the process water to be used as steepwater for a subsequent starch recovery process.

6. The process of claim **1** wherein the starch slurry is introduced to a starch hydrolysis unit for the conversion of the starch to an aqueous solution of fermentable sugar.

4,255,519
GLYCEROL OXIDASE AND PROCESS FOR THE PRODUCTION THEREOF

Osamu Terada; Takayuki Uwajima, both of Machida, and Hiroko Akita, Yokohama, all of Japan, assignors to Kyowa Hakko Kogyo Co., Ltd., Japan

Filed Jul. 19, 1979, Ser. No. 59,101

Claims priority, application Japan, Jul. 21, 1978, 53/88261

Int. Cl.³ C12N *9/04*; G01N *31/14*

U.S. Cl. 435—190 **7 Claims**

1. An oxidizing enzyme of glycerol having the following properties:

(1) action: oxidizes glycerol in the presence of oxygen to form hydrogen peroxide and glyceraldehyde;

(2) substrate specificity: a specific activity for glycerol and dihydroxyacetone;

(3) optimum pH: 7.8–8.6;

(4) stable pH: 7.5–10.0;

(5) optimum temperature for action: 37° C.; and

(6) Michaelis constant against glycerol (Km value): 8.0×10^{-3} M.

4,255,520
PROCESS FOR THE PREPARATION OF A RABIES VACCINE AND VACCINE OBTAINED BY THIS PROCESS

Klaus R. Schell, Flamatt, Switzerland, assignor to Schweizerisches Serum-und Impfinstitut and Institut zur Erforschung der Infektionskrankheiten, Bern, Switzerland

Filed Apr. 2, 1980, Ser. No. 136,722

Claims priority, application Switzerland, Apr. 10, 1979, 3414/79

Int. Cl.³ A61K *39/205*

U.S. Cl. 435—239 **3 Claims**

1. In a method for the preparation of rabies vaccine wherein rabies viruses are multiplied in poultry embryos, the embryos are harvested and a cell extract containing the rabies antigen is

separated therefrom and processed for use, the improvement which comprises harvesting only the heads of the embryos and separating the antigen by differential centrifugation and density gradient centrifugation.

4,255,521

METHOD FOR ISOLATION OF GLUCOSE ISOMERASE

Hideo Hirohara; Shigeyasu Nabeshima; Satoshi Mitsuda, all of Ibaraki, and Tsuneyuki Nagase, Takatsuki, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed May 21, 1979, Ser. No. 40,872
Claims priority, application Japan, May 25, 1978, 53/62893
Int. Cl.[3] C12N 9/92
U.S. Cl. 435—234 9 Claims

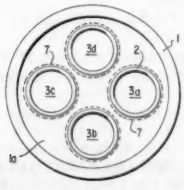
1. A process for extracting glucose isomerase from cells of microorganisms of the geneus Streptomyces containing glucose isomerase, which comprises carrying out a continuous homogenization operation for the extraction by means of the cycle of (i) suction of a suspension of the microorganism cells, (ii) application of the pressure on the suspension, (iii) instantaneous pressure drop to less than an atmosphere by passing through a aperture, (iv) impact of the suspension particles to walls and (v) the discharge of the homogenized product, wherein the concentration of the suspension of the microorganism cells is from 1.5 to 6 weight % on a dry substance base and the pressure is from 450 to 600 Kg/cm^2.

4,255,522

PETRI DISH

Norbert Fusenig, Heidleberg, and Wolfgang Thon, Essen, both of Fed. Rep. of Germany, assignors to Deutsches Krebsforschungszentrum, Heidelberg, Fed. Rep. of Germany

Filed Jun. 22, 1979, Ser. No. 51,239
Claims priority, application Fed. Rep. of Germany, Jul. 1, 1978, 7819857[U]
Int. Cl.[3] C12M 1/22
U.S. Cl. 435—297 3 Claims



1. In a petri dish including a dish-shaped vessel having a bottom; the improvement comprising

(a) a plurality of elevated ridges rising from said bottom; said ridges each having a closed configuration for defining separate, delimited bottom zones; and

(b) weakened lines provided in said bottom; said weakened lines each having a closed configuration and each extending around a separate one of said ridges for permitting a removal of said bottom zones, together with the respective ridges, by breaking them out of said bottom.

4,255,523

CATION EXCHANGE MEMBRANE OF FLUORINATED POLYMER FOR ELECTROLYSIS AND PREPARATION THEREOF

Hiroshi Ukihashi, Tokyo; Tatsuro Asawa, and Tomoki Gunjima, both of Yokohama, all of Japan, assignors to Asahi Glass Company, Limited, Tokyo, Japan

Filed May 3, 1978, Ser. No. 902,759
Claims priority, application Japan, Jun. 3, 1977, 52/64900; Nov. 1, 1977, 52/130288; Feb. 10, 1978, 53/13560
The portion of the term of this patent subsequent to Aug. 19, 1997, has been disclaimed.
Int. Cl.[3] C08J 5/22
U.S. Cl. 521—27 11 Claims

1. A fluorinated polymer cation exchange membrane for electrolysis which comprises a cation exchange resin of a perfluorocarbon polymer having carboxylic acid groups or functional groups which can be converted to carboxylic acid groups said resin having 0.5 to 2.8 wt. % fibrils of polytetrafluoroethylene incorporated therein, wherein said fibrils are formed by applying shear stress to particles of polytetrafluoroethylene.

4,255,524

SYNTACTIC FOAM COMPOSITIONS USEFUL FOR MANUFACTURING FLOATING ARTICLES

Francois Dawans, Bougival, and Daniel Binet, Rueil Malmaison, both of France, assignors to Institut Francais du Petrole, Rueil-Malmaison, France

Filed Oct. 16, 1979, Ser. No. 85,366
Claims priority, application France, Oct. 16, 1978, 78 29610
Int. Cl.[3] C08J 9/32
U.S. Cl. 521—54 11 Claims

1. A syntactic foam composition obtained by heat-curing a mixture comprising a resin and inorganic or organic hollow spheres in the presence of at least one free radical generator; said resin consisting essentially of:

(a) 10 to 100% by weight of at least one polybutadiene whose microstructure contains 20–95% of 1,2-units, 5 to 60% thereof being in a carbocyclic cyclized form, the unsaturation remainder being in a cis or trans 1,4 form, and whose number average molecular weight is at most 100,000;

(b) 0 to 90% by weight of at least one polybutadiene whose microstructure contains 40–98% of 1,2-units and 2–60% of cis or trans 1,4 units, and whose number average molecular weight is at most 100,000; and

(c) 0 to 90% by weight of at least one liquid vinyl monomer which can polymerize in the presence of free radicals.

4,255,525

SMALL PARTICULATE EXPANDABLE STYRENE POLYMER MOLDING COMPOSITIONS

Josef K. Rigler; Wolfgang Schäfer; Horst Leithäuser; Karl Trukenbrod, all of Marl, and Werner Bollmann, Haltern, all of Fed. Rep. of Germany, assignors to Chemische Werhe Hüls AG, Marl, Fed. Rep. of Germany

Filed Aug. 29, 1979, Ser. No. 70,815
Claims priority, application Fed. Rep. of Germany, Sep. 13, 1978, 2839714
Int. Cl.[3] C08J 9/22
U.S. Cl. 521—57 8 Claims

1. In a process for the preparation of shaped bodies based on expanded styrene polymers comprising: the polymerization with the addition of an expanding agent of styrene or a mixture thereof with at least one monomer copolymerizable therewith and forming expandable styrene particles each having a continuous surface, preforming of the resulting expandable particles, aging of the preformed particles, and molding thereof in a pressure resistant mold, the improvement comprising: coating with aqueous or alcoholic solution said surface prior to pre-

forming with a continuous coating of betaines having the general formula

$$(R)_3\text{-}N^+\text{-}CH_2COO^-$$

where R represents the same or different hydrocarbon groups having 1 to 4 carbon atoms to prevent build up of static charges on said surface.

4,255,526

METHOD OF PRODUCING A MOISTURE- AND HEAT-RESISTANT FLEXIBLE POLYURETHANE FOAM

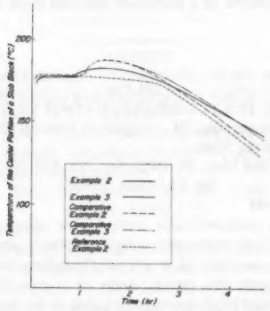
Toshio Yukuta; Hiroya Fukuda, and Seiji Ishii, all of Yokohama, Japan, assignors to Bridgestone Tire Company Limited, Tokyo, Japan

Filed Aug. 27, 1979, Ser. No. 70,081

Claims priority, application Japan, Aug. 25, 1978, 53-102876

Int. Cl.³ C08G *18/14, 18/32, 18/38*

U.S. Cl. 521—108 **6 Claims**



1. In a method of producing a moisture- and heat-resistant flexible polyurethane foam from a raw material mixture of a polyhydroxyl compound, an organic polyisocyanate, water, a catalyst, a surfactant and a foaming agent, the improvement comprising adding 0.01–5 parts by weight based on 100 parts by weight of said polyhydroxyl compound of an amino acid or a compound selected from the group consisting of hydantoin, hydantoic acid, uric acid, L-pyrrolidone-5-carboxylic acid and DL-pyrrolidone-5-carboxylic acid to the raw material mixture as an additive, and foaming the resulting mixture.

4,255,527

NOVEL BLOWING AGENT FOR POLYMERIC FOAM PROCESS

Santanu Roy, Newport Beach, Calif., assignor to George F. Thagard, Jr., Newport Beach, Calif.

Division of Ser. No. 882,280, Mar. 1, 1978, abandoned. This application Jul. 19, 1979, Ser. No. 59,114

Int. Cl.³ C08G *18/14, 18/30, 18/34*

U.S. Cl. 521—117 **2 Claims**

1. A blowing agent for a polymeric foam derived from a reaction mixture comprising an organic polyisocyanate compound and a compund having more than one active hydrogen, the blowing agent comprising a mixture of dibutylphthalate and ethanol, the molar ratio of ethanol to dibutylphthalate being in the range of from about 1.5 to about 4.

2. A method of preparing a polymeric foam from a reaction mixture comprising an organic polyisocyanate compound and a compound having more than one active hydrogen, the method including mixing with the reaction mixture water and a blowing agent comprising ethanol and dibutylphthalate, the molar ratio of ethanol to dibutylphthalate being in the range of from about 1.5 to about 4.

4,255,528

POLYURETHANE PROCESS

Daniel S. Raden, Hawthorn Woods; Chala V. Maripuri, Skokie, and Frank C. Becker, Gurnee, all of Ill., assignors to Abbott Laboratories, North Chicago, Ill.

Continuation of Ser. No. 963,483, Nov. 24, 1978, abandoned. This application Sep. 24, 1979, Ser. No. 78,354

Int. Cl.³ C08J *9/14*

U.S. Cl. 521—129 **11 Claims**

1. The process of preparing a polyurethane foam consisting essentially in carrying out the polymerization reaction between a polyol and a polyisocyanate in the presence of catalytical amounts of tris(3-dimethylaminopropyl)amine at 0°–40° C. and in the presence of a blowing agent.

4,255,529

PROCESS FOR THE PREPARATION OF CELLULAR OR NON-CELLULAR POLYURETHANE RESINS

Edgar Möhring, Bergisch-Gladbach; Hanns P. Müller, and Kuno Wagner, both of Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Division of Ser. No. 934,650, Aug. 17, 1978. This application May 14, 1979, Ser. No. 39,050

Claims priority, application Fed. Rep. of Germany, Aug. 24, 1977, 2738154

Int. Cl.³ C08G *18/14, 18/54*

U.S. Cl. 521—158 **1 Claim**

1. A process for the preparation of cellular or non-cellular polyurethane resins by the reaction of

(a) organic polyisocyanates with

(b) compounds containing at least 2 active hydrogen atoms and having a molecular weight of from 32 to 400, optionally

(c) compounds containing at least 2 active hydrogen atoms and having a molecular weight of from 400 to 10,000, and optionally

(d) blowing agents, catalysts and other known additives, characterized in that the compounds used as component (b) are low molecular weight polyhydroxyl compounds prepared by condensing formaldehyde hydrate in the presence of soluble or insoluble compounds of metals of the 2nd to 4th Main Group or 2nd to 8th sub-Group of the Periodic System of Elements as catalyst, and optionally in the presence of compounds capable of enediol formation as cocatalyst and/or of low molecular weight and/or higher molecular weight polyhydroxyl compounds, controlling the pH during the condensation reaction by the addition of from 5 to 200 milliequivalents, based on 1 mol of formaldehyde, of a tertiary amine which contains an electrophilic hetero atom in the β-position to the tertiary nitrogen atom.

4,255,530

CROSS-LINKABLE LACQUER BINDER CONTAINING SATURATED LACTAM

Peter Höhlein, and Jochen Schoeps, both of Krefeld, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Fed. Rep. of Germany

Filed Nov. 20, 1979, Ser. No. 95,976

Claims priority, application Fed. Rep. of Germany, Nov. 24, 1978, 2850871

Int. Cl.³ C08L *33/08*

U.S. Cl. 525—6 **3 Claims**

1. A binder composition which comprises

(A) from 99 to 50%, by weight based on the weight of (A) plus (B), of a copolymer consisting of copolymerized units of

(a) from 5 to 90%, by weight based on the copolymer, of at least one aliphatic (meth) acrylate containing from 1 to 8 carbon atoms in the alcohol moiety;

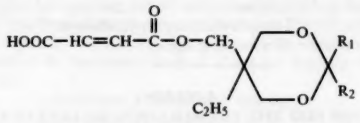
(b) from 0 to 60%, by weight based on the copolymer, of at

least one aromatic vinyl or isopropylene compound containing from 8 to 14 carbon atoms;

(c) from 1 to 40%, by weight based on the copolymer, of at least one comonomer selected from the group consisting of

(I) at least one mono (meth) acrylate of an alcohol containing from 2 to 8 carbon atoms and having from 2 to 4 hydroxyl groups and

(II) at least one maleic acid semi-ester corresponding to the formula



wherein

R_1 is hydrogen or methyl; and

R_2 is hydrogen, methyl, ethyl, propyl, i-propyl or phenyl; and

(d) from 0 to 60%, by weight based on the copolymer, of at least one other olefinically unsaturated comonomer; and

(B) from 1 to 50%, by weight based on the weight of (A) plus (B), of a saturated lactam.

4,255,531

BLENDS WITH POLY(P-METHYLSTYRENE)

Harold A. Arbit, Highland Park, N.J., assignor to Mobil Oil Corporation, Fairfax, Va.

Continuation-in-part of Ser. No. 69,481, Aug. 24, 1979, abandoned, which is a continuation-in-part of Ser. No. 971,178, Dec. 20, 1978, abandoned. This application Dec. 10, 1979, Ser. No. 101,655

Int. Cl.[3] **C08L** *0/00*

U.S. Cl. 525—237 **7 Claims**

1. A blend of poly(p-methylstyrene) with between about 0.1 weight percent and about 10 weight percent low molecular weight poly (C_2–C_4) monoolefin, monoolefin copolymer, or styrene-butadiene rubber.

4,255,532

ACRYLIC POLYMER COMPOSITION FOR MELT-SPINNING

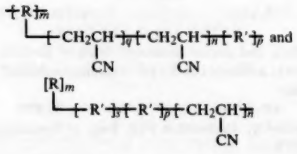
Shashikumar H. Daftary, Pensacola, Fla., assignor to American Cyanamid Company, Stamford, Conn.

Filed Feb. 21, 1979, Ser. No. 12,980

Int. Cl.[2] **C08F** *16/06;* **C08L** *51/06, 33/24, 33/20*

U.S. Cl. 525—59 **4 Claims**

1. A polymer comprising repeating units of the structure:



wherein R is a grafted poly(vinyl alcohol), R′ represents repeating units derived from acrylamido methyl propane sulfonic acid and an acrylic ester selected from the group consisting of methyl acrylate, ethyl acrylate, butyl acrylate, methoxymethyl acrylate, beta-chloroethyl acrylate and the corresponding esters of methacrylic acid and chloroacrylic acid, m represents a weight fraction of about 0.01 to 0.10, q+n represents a weight fraction of about 0.80 to 0.89, p+s represents a weight fraction of about 0.01 to 0.19, the units represented by p and n occurring in random order and the kinematic molecular weight of the polymer being from about 30,000 to 60,000.

4,255,533

COPPER ADHESIVE COMPOSITION

Kenneth W. Bartz, Baytown, Tex., assignor to Exxon Research & Engineering Co., Florham Park, N.J.

Continuation of Ser. No. 746,930, Dec. 8, 1976, abandoned, which is a continuation of Ser. No. 554,276, Feb. 28, 1975, abandoned, which is a continuation of Ser. No. 340,061, Mar. 12, 1973, abandoned. This application Sep. 28, 1978, Ser. No. 946,909

Int. Cl.[3] **C08L** *51/04, 51/06*

U.S. Cl. 525—71 **1 Claim**

1. A thermoplastic adhesive composition having outstanding adhesion to copper comprising a blend of

(a) about 85 weight percent of low density polyethylene; and

(b) about 15 weight percent of butyl rubber,

wherein said blend has been grafted with from 0.02 to 20 weight percent of a monomer selected from acrylic acid.

4,255,534

BINARY POLYCARBONATE COMPOSITIONS

Ping Y. Liu, Naperville, Ill., assignor to General Electric Company, Pittsfield, Mass.

Filed Mar. 20, 1980, Ser. No. 132,190

Int. Cl.[3] **C08L** *53/00*

U.S. Cl. 525—91 **8 Claims**

1. A binary polycarbonate composition comprising an admixture of a high molecular weight aromatic polycarbonate and a minor amount of a styrene/butadiene/caprolactone block copolymer, the weight ratio of styrene:butadiene:caprolactone in said block copolymer being in the range of about 15-25: 45-55: 25-35.

4,255,535

ORGANIC POLYMERS WITH NEAR-ZERO UNIAXIAL THERMAL EXPANSION COEFFICIENTS

Ray H. Baughman, Morris Plains; Edith A. Turi, Livingston; Anthony F. Preziosi, Ledgewood, and Kwok-Chun Yee, Randolph, all of N.J., assignors to Allied Chemical Corporation, Morris Township, Morris County, N.J.

Continuation-in-part of Ser. No. 704,856, Jul. 13, 1976, abandoned, which is a division of Ser. No. 537,488, Dec. 30, 1974, Pat. No. 3,994,867. This application Dec. 15, 1978, Ser. No. 970,093

Int. Cl.[3] **C08G** *18/62*

U.S. Cl. 525—129 **2 Claims**

1. A process for preparing a composite having a near-zero uniaxial thermal expansion coefficient comprising uniaxially or biaxially orienting at least one highly chain-aligned polyacetylene, possessing a negative uniaxial thermal expansion coefficient, within a solid matrix material possessing a positive thermal expansion coefficient, said chain-aligned polyacetylene having its negative uniaxial thermal expansion coefficient, α_1, given by $\alpha_1 = a_1 + b_1 t$ and said matrix material having its positive thermal expansion coefficient, α_2, given by $\alpha_2 = a_2 + b_2 t$; each being selected such that the ratio a_1/b_1 approximately equals the ratio a_2/b_2; "t" being temperature in the region of interest in °C.; wherein said polyacetylene is obtained by solid state polymerization of crystals of 2,4-hexadiyn-1,6-diol-bisphenylurethane, and said solid matrix material is polyvinylidene fluoride polymer having its positive thermal expansion coefficient given by the expression $\alpha_2 = 1.01 \times 10^{-4}$° C.$^{-1} + 8.0 \times 10^{-7}$° C.$^{-2}$t, where "t" is temperature in °C.

4,255,536

AZODICARBOXYLATE-MODIFIED COPOLYMERS

Kishore Udipi, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Apr. 24, 1979, Ser. No. 32,978
Int. Cl.[3] C08F 8/30
U.S. Cl. 525—314 35 Claims

1. A gel free modified copolymer of at least one conjugated diene and at least one monovinylarene prepared by the process which comprises:

contacting (A) an unsaturated precursor copolymer of at least one conjugated diene and at least one monovinylarene characterized by a number average molecular weight of at least about 5,000, a residual olefinic unsaturation of at least about 5 mol percent, and about 5:95 to 95:5 weight percent copolymerized conjugated diene:monovinylarene, with (B) at least one dihydrocarbyl azodicarboxylate under reaction conditions employing amounts of dihydrocarbyl azodicarboxylate effective to improve at least one of the oil swell resistance and wet skid resistance in a cured state of said precursor copolymer.

4,255,537

POLYMERIC IMMUNOREGULATORY AGENTS CONTAINING HALF-AMIDE/HALF CARBOXY/IMIDE GROUPS

Joseph E. Fields, Ballwin; Samuel S. Asculai, St. Louis, and John H. Johnson, Kirkwood, all of Mo., assignors to Monsanto Company, St. Louis, Mo.

Filed Jan. 22, 1979, Ser. No. 5,638
Int. Cl.[3] C08F 8/30
U.S. Cl. 525—328 11 Claims

1. A composition selected from the group consisting of a copolymer of at least one olefin monomer having from 2 to about 4 carbon atoms and at least one α,β-unsaturated polycarboxylic anhydride having from 4 to about 6 carbon atoms, having an average molecular weight of from about 300 to about 1500, and derivatized to obtain both (a) half-amide, half-carboxyl acid groups and (b) imide groups in with said imide groups comprise from about 5% by weight to about 40% by weight of said derivatized groups, and the N-alkylated derivatives and pharmaceutically acceptable cationic salt derivatives of said derivatized copolymer, said N-alkylated derivatives having from 1 to 4 carbon atoms in the alkyl substituents.

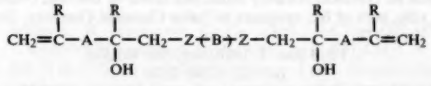
4,255,538

LIQUID VINYLIDENE-TERMINATED POLYMERS CURED WITH AMINES AND THIOLS

Douglas E. Skillicorn, Avon Bake, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

Division of Ser. No. 738,195, Nov. 3, 1976, Pat. No. 4,129,713, which is a division of Ser. No. 585,962, Jun. 11, 1975, Pat. No. 4,013,710, which is a division of Ser. No. 292,926, Sep. 28, 1972, Pat. No. 3,910,992. This application Dec. 11, 1978, Ser. No. 968,234
Int. Cl.[2] C08F 8/00; C08J 3/24; C08K 5/37, 5/17
U.S. Cl. 525—329 11 Claims

1. A liquid vinylidene-terminated polymer having a molecular weight of from about 1000 to about 20,000 of the structure



wherein B is a polymeric backbone of carbon-carbon, polyether, or polysulfide linkages; Z is selected from the group consisting of —O—, —S—, —NH—,

and —O—CH_2—CH_2—; A is a bivalent radical selected from the group consisting of

CH_2—O—CH_2, and —CH_2—O—; and R is hyrogen or an alkyl radical containing 1 to 4 carbon atoms, said polymer having been vulcanized using a curative selected from the group consisting of dithiols, polythiols, primary and secondary amines, and primary and secondary polyamines.

4,255,539

METHOD OF PREPARING SULFUR-MODIFIED POLYCHLOROPRENE

Paul Branlard, Grenoble, and Jean-Pierre Merle, Echirolles, both of France, assignors to Distugil, Neuilly-sur-Seine, France

Filed Oct. 31, 1979, Ser. No. 89,732
Claims priority, application France, Nov. 7, 1978, 78 31425
Int. Cl.[3] G08F 8/00; C08F 8/34
U.S. Cl. 525—330 9 Claims

1. A method of preparing sulfur-modified polychloroprene by copolymerization of chloroprene with sulfur, in alkaline aqueous emulsion and in the presence of a free-radical initiator, at least one organic polysulfides selected from the class consisting of:

(a)-di- and tetra-alkylthiuram disulfides in which the alkyl group contains from about 3 to 5 carbon atoms;

(b)-benzothiazyl disulfide;

(c)-benzyl polysulfides in which the number of sulfur atoms is equal to or greater than 3;

(d)-2,4,5-trichlorophenyl trisulfide; and

(e)-benzanilide disulfide and the said polysulfide is introduced before the initiation of the polymerization in proportions of between about 0.1 and 2 parts to 100 parts, by weight, of chloroprene charged.

4,255,540

NEUTRALIZED PHOSPHONATED ELASTOMERIC POLYMERS

Robert A. Weiss, Summit, N.J., assignor to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Apr. 19, 1979, Ser. No. 31,542
Int. Cl.[3] C08F 8/44, 8/42, 8/40
U.S. Cl. 525—332 2 Claims

1. A neutralized phosphonylated elastomeric ionically crosslinked copolymer of ethylene-propylene which has a number average molecular weight of at least 10,000 having about 15 to about 150 mmoles of neutralized phosphonic acid groups, said phosphonic acid groups being at least 95% neutralized with a counterion selected from the group consisting of ammonium, antimony, aluminum, and metal ions of Groups IA, IIA, IB, IIB of the Periodic Table of Elements and mixtures thereof.

4,255,541
ACRYLIC GRAFT COPOLYMERS AND COATING COMPOSITIONS THEREOF

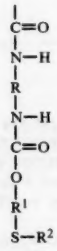
John A. Simms, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 972,425, Dec. 22, 1978, Pat. No. 4,206,294, which is a division of Ser. No. 820,879, Aug. 1, 1977, Pat. No. 4,151,227. This application Oct. 19, 1979, Ser. No. 87,464

Int. Cl.[3] **C08F** *283/02;* **C08G** *63/76;* **C08L** *67/02*

U.S. Cl. 525—437 **4 Claims**

1. A graft copolymer consisting essentially of about 25–95% by weight of a polyester backbone consisting essentially of a polyol and an organic dicarboxylic acid and about 5–75% by weight of side chains; wherein the polyester backbone contains pendant hydroxyl groups before the attachment of side chains by replacement of a hydrogen of at least one of the hydroxyl groups by the formula



where R is an aliphatic group, a cycloaliphatic group or an aromatic group R^1 is an alkylene group having 2–6 carbon atoms, R^2, which forms a side chain, is an acrylate polymer.

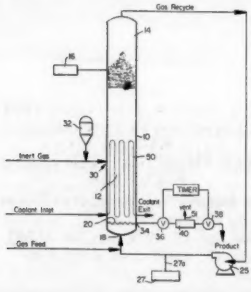
4,255,542
EXOTHERMIC POLYMERIZATION IN A VERTICAL FLUID BED REACTOR SYSTEM CONTAINING COOLING MEANS THEREIN AND APPARATUS THEREFOR

Gary L. Brown, South Charleston, W. Va.; David F. Warner, Beaumont, Tex., and Jae H. Byon, South Charleston, W. Va., assignors to Union Carbide Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 897,512, Apr. 18, 1978, abandoned. This application Nov. 30, 1978, Ser. No. 964,989

Int. Cl.[3] **C08F** *2/34, 10/02*

U.S. Cl. 526—88 **6 Claims**



1. A continuous low pressure gas phase process for the production of solid particulate polymers during an exothermic polymerization reaction in a fluid bed reaction system comprising a vertical fluidized bed reactor which is of uniform diameter through its entire height, said reaction system being devoid of particle entrainment means, which comprises feeding a polymerization catalyst and a gaseous stream containing at least one polymerizable monomer to a fluidized bed of polymer particles in said reactor at a pressure of 50 to 1000 psi, removing the exothermic heat of reaction with, as the only cooling means employed for such purpose, indirect cooling means in said fluidized bed in said reactor and removing particulate polymer from said reactor, and wherein the mass gas flow rate through the fluidized bed is in the range of from about 1.5 to <10 G_{mf} based on the minimum free cross-sectional area of the bed.

4,255,543
PROCESS FOR THE PREPARATION OF 1,2-POLYBUTADIENE

Kenya Makino, Kuwana; Toshio Miyabayashi, Yokkaichi; Noboru Ohshima, Yokkaichi, and Yasumasa Takeuchi, Yokkaichi, all of Japan, assignors to Japan Synthetic Rubber Co., Ltd., Tokyo, Japan

Filed Aug. 15, 1979, Ser. No. 66,698

Claims priority, application Japan, Aug. 21, 1978, 53-100969

Int. Cl.[3] **C08F** *4/70*

U.S. Cl. 526—92 **6 Claims**

1. A process for preparing 1,2-polybutadiene with a vinyl content of at least 70% by contacting 1,3-butadiene with a catalyst consisting of (A) a cobalt compound, (B) an organic phosphine compound, (C) a trialkylaluminum compound and (D) water in an amount of 0.1 to 1.2 moles per mole of said trialkylaluminum in the presence of a molecular weight regulator, characterized in that as the molecular weight regulator, (E) an alkylaluminum halide compound is allowed to be present in the reaction system in an amount of at least 0.01 mole per mole of the trialkylaluminum compound (C).

4,255,544
PROCESS FOR POLYMERIZATION OF ETHYLENE

Akio Kimura, and Satoshi Asahi, both of Sodegaura, Japan, assignors to Idemitsu Kosan Co., Ltd., Tokyo, Japan

Filed Mar. 28, 1980, Ser. No. 134,759

Claims priority, application Japan, Apr. 9, 1979, 54-42043

Int. Cl.[3] **C08F** *4/02, 10/02*

U.S. Cl. 526—124 **7 Claims**

1. In a process for polymerizing ethylene in the presence of a catalyst comprising (A) a reaction product of magnesium compound and titanium halide and (B) an organic aluminum compound, the improvement characterized in that there is employed as Component A a solid material, which is produced by the process comprising

reacting magnesium dialkoxide with a halogen-containing silicon compound of the formula $X_n^1 Si(OR^1)_{4-n}$ wherein X^1 is a halogen atom, R^1 is an alkyl group, and $O<n\leqq 4$, and an alcohol to form a modified magnesium dialkoxide, said alcohol being in an amount of from 0.1 to 10 moles per mole of said magnesium dialkoxide, said halogen-containing silicon compound being in an amount to provide a halogen/magnesium atomic ratio of 1 or less, and

reacting said modified magnesium dialkoxide with a titanium halide in the presence of an alkoxy-containing silicon compound of the formula: $X_{4-m}^2 Si(OR^2)_m$ wherein X^2 is a halogen atom, R^2 is an alkyl group, and $O<m\leqq 4$, to form said solid material.

4,255,545
DISCRETE BEAD POLYMER PROCESS

John R. Hurlock, Hickory Hills, and Louis A. Goretta, Naperville, both of Ill., assignors to Nalco Chemical Company, Oak Brook, Ill.

Filed Jan. 7, 1980, Ser. No. 109,985

Int. Cl.[3] **C08F** *2/00*

U.S. Cl. 526—201 **2 Claims**

1. A method of producing polysodium acrylate in essentially dry bead form free of aggregate, having a particle size distribution such that the majority of particles are in the range of 0.5

to 1 mm. diameter with few of greater than 2.5 mm. or less than 0.5 mm. comprising:

polymerizing aqueous sodium acrylate monomer in a body of hydrocarbon solvent in the form of toluene-tetrachloroethylene hydrocarbon solvent in which is dissolved a protective colloid in the form of polymethyl methacrylate;

and separating the resultant polymer particles which are essentially free of water and unreacted monomer.

4,255,546

ACRYLONITRILE POLYMERIZATION IN FLUORINATED HYDROCARBONS

Carlhans Süling, Odenthal; Siegfried Korte, Leverkusen, and Theo Neukam, Dormagen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Sep. 20, 1979, Ser. No. 77,460

Claims priority, application Fed. Rep. of Germany, Oct. 4, 1978, 2843157

Int. Cl.³ C08F *4/40*

U.S. Cl. 526—206 **7 Claims**

1. A process for the production of polyacrylonitrile or acrylonitrile copolymers, which comprises polymerizing acrylonitrile alone or with up to 30% by weight of at least one ethylenically unsaturated comonomer at a temperature of from −40° to +60° C., in an aliphatic chloro-fluorine- or fluorine-substituted hydrocarbon containing up to 8 carbon atoms and having a boiling point of −60° to +50° C. or in mixtures thereof having boiling ranges of from −60° to +50° C. and using a starter system consisting of from 0.1 to 0.3 mole % of a hydroperoxide, from 0.1 to 12 mole % of sulphur dioxide and from 0.01 to 1.0 mole % of a partially halogenated or perhalogenated carboxylic acid containing up to 10 carbon atoms (based on the total amount of monomers used), polymerization being continued up to conversions of from 30 to 90% by weight.

4,255,547

NOVEL ELASTOMER COMPOSITION AND PROCESSES THEREFOR

Volker D. Arendt, Princeton, N.J., assignor to American Cyanamid Company, Stamford, Conn.

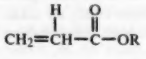
Division of Ser. No. 967,814, Dec. 8, 1978. This application Mar. 10, 1980, Ser. No. 129,139

Int. Cl.³ C08F *14/14*

U.S. Cl. 526—291 **10 Claims**

1. A vulcanizable elastomeric composition consisting essentially of a copolymer of:

(a) 89 to 40%, by weight, based on the total weight of the composition, of an acrylic acid ester, or mixture of acrylic acid esters, represented by the formula



(I)

wherein R represents C_1–C_4 alkyl, —CH_2—CH_2OR', wherein R′ represents C_1–C_4 alkyl, or —CH_2CH_2CN;

(b) 10 to 45%, by weight, same basis, of an α,β-unsaturated diester selected from bis (2-methoxyethyl)-fumarate, bis (2-methoxyethyl)maleate, or mixtures thereof; and

(c) 1 to 10%, by weight, same basis of an unsaturated monomer containing either a halogen atom or an epoxy group.

4,255,548

ETHYLENE-VINYLAMINE COPOLYMERS

Robert E. Wingard, Jr., Palo Alto, and Eric R. Larson, Concord, both of Calif., assignors to Dynapol, Palo Alto, Calif.

Filed Jan. 7, 1980, Ser. No. 110,071

Int. Cl.³ C08F *226/02*

U.S. Cl. 526—310 **3 Claims**

1. A random copolymer consisting essentially of ethylene and vinylamine repeating units.

4,255,549

PROCESS FOR PREPARING ORGANOSILAZANES

Peter Christophliemk, Düsseldorf; Riza N. Oezelli, Neuss, and Guenther Tischbirek, Düsseldorf, all of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien (Henkel KGaA), Düsseldorf-Holthausen, Fed. Rep. of Germany

Filed Jul. 25, 1979, Ser. No. 60,277

Claims priority, application Fed. Rep. of Germany, Aug. 3, 1978, 2834027

Int. Cl.³ C08G *77/04*

U.S. Cl. 528—28 **12 Claims**

1. In the process for the preparation of a condensable, film-forming organosilazane of formula $R_nSi(NH_2)_{4-n}$, wherein R represents a monovalent hydrocarbon radical and n is 1,2, or 3, by ammonolysis of an organohalosilane of formula R_nSiX_{4-n}, wherein R and n are as defined above and X is a halogen atom, with ammonia, the improvement comprising reacting a from about 5 to 15% by weight solution of the organohalosilane in inert solvent with excess liquid ammonia under pressure at temperatures of between 0 ° and 50° C.

4,255,550

POLYURETHANE POLYMERS CHARACTERIZED BY CARBOXYLATE GROUPS AND HYDROXYL GROUPS IN THE POLYMER BACKBONE

Francis E. Gould, Princeton, N.J., assignor to Tyndale Plains - Hunter Ltd., Princeton, N.J.

Continuation-in-part of Ser. No. 864,715, Dec. 27, 1977, Pat. No. 4,156,067, which is a continuation-in-part of Ser. No. 809,260, Jun. 23, 1977, Pat. No. 4,156,066. This application Dec. 22, 1978, Ser. No. 972,609

The portion of the term of this patent subsequent to May 22, 1996, has been disclaimed.

Int. Cl.³ C08G *18/42*

U.S. Cl. 528—44 **12 Claims**

1. A water insoluble polyurethane polyether resin that is soluble in ethanol at pH 11, containing carboxylic acid groups and hydroxyl groups in the polymer backbone, the number of hydroxyl groups in the polymer backbone being at least equal to the number of carboxylic acid groups; said polyurethane polyether being characterized by a molecular weight above 6,000.

4,255,551

COATING MATERIALS AND THEIR APPLICATION PREPARED FROM POLYISOCYANATES BLOCKED WITH IMIDAZOLINES

Elmar Wolf, Herne; Johann Obendorf, Dorsten, and Rainer Gras, Herne, all of Fed. Rep. of Germany, assignors to Chemische Werke Huls AG, Herne, Fed. Rep. of Germany

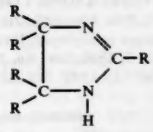
Filed Oct. 3, 1978, Ser. No. 948,150

Claims priority, application Fed. Rep. of Germany, Oct. 5, 1977, 2744721

Int. Cl.³ C08G *18/80*

U.S. Cl. 528—45 **14 Claims**

1. Powdered, heat-hardenable coating materials with high storage stability and a grain size smaller than 0.25 mm, comprising hydroxyl-group-containing polyesters with melting points between 40° and 120° C., blocked polyisocyanates and, optionally, catalysts wherein the coating material contains polyisocyanates blocked with cyclic amidines of the general formula



wherein R=equal or different substituents selected from the group consisting of hydrogen, alkyl-, cycloalkyl-, aralkyl- and aryl radicals.

4,255,552

THERMOSETTING POLYURETHANE COMPOSITIONS

Charles S. Schollenberger, Hudson, and Kornelius Dinbergs, Broadview Heights, both of Ohio, assignors to The B. F. Goodrich Company, Akron, Ohio

Filed Oct. 3, 1979, Ser. No. 81,430
Int. Cl.³ C08G *18/32*
U.S. Cl. 528—50 **15 Claims**

1. A process for preparing cross-linkable peroxide containing polyurethanes comprising mixing together in a liquid state a hydroxyl or amine terminated compound having a molecular weight greater than 300 with an organic diisocyanate and an organic peroxide having a minimum half-life value of about 1 hour at 100° C. and heating the mixture to form a polyurethane elastomer.

4,255,553

POWDER COATING COMPOSITION

Yutaka Mizumura, Shiga; Iori Naito, and Hideo Miyake, both of Otsu, all of Japan, assignors to Toyo Boseki Kabushiki Kaisha, Japan

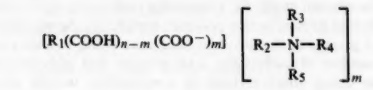
Filed Jun. 4, 1979, Ser. No. 45,521
Int. Cl.³ C08G *59/42, 81/00*
U.S. Cl. 528—93 **15 Claims**

1. A powder coating composition which comprises:

(a) a compound having at least two epoxy groups in the molecule;

(b) a polyester or acrylic resin having a molecular weight of 1,000 to 7,000 and an acid value of not less than 20 having at least two carboxyl groups; and

(c) a compound of the formula:



wherein m and n are each an integer of from 1 to 10^5 provided that $m \leqq n$; R_1 is a residue of a mono or polybasic carboxylic acid (the number of the carboxyl groups $n=1$ to 10^5); and R_2, R_3, R_4, and R_5 are, the same or different, each being an alkyl group having 1 to 30 carbon atoms substituted with a halogen, nitro group, an alkoxy group having 1 to 4 carbon atoms or furyl; a cycloalkylalkyl group having 6 to 10 carbon atoms; a cycloalkyl group having 5 to 8 carbon atoms substituted with a halogen, nitro group, an alkyl group having 1 to 4 carbon atoms, an alkoxy group having 1 to 4 carbon atoms or furyl; an aryl group having 6 to 20 carbon atoms, or a substituted aryl group having 6 to 20 carbon atoms substituted with a halogen, nitro group, an alkyl group having 1 to 4 carbon atoms, an alkoxy group having 1 to 4 carbon atoms or furyl; or an aralkyl group having 7 to 30 carbon atoms substituted with a halogen, nitro group, an alkyl group having 1 to 4 carbon atoms, an alkoxy group having 1 to 4 carbon atoms or furyl; or at least two of R_2 to R_5 forming, together with the nitrogen atom, a saturated or unsaturated heterocyclic group.

4,255,554

PROCESS FOR PREPARING PHENOL-FORMALDEHYDE-FURFURYL ALCOHOL TERPOLYMERS

Joseph P. Wuskell, Barrington, Ill., assignor to The Quaker Oats Company, Chicago, Ill.

Filed Oct. 15, 1979, Ser. No. 84,801
Int. Cl.³ C08G *8/04, 8/08, 14/02*
U.S. Cl. 528—129 **5 Claims**

1. A process for preparing a terpolymer of a phenolic compound, an aldehyde and furfuryl alcohol which comprises reacting at an elevated temperature under essentially anhydrous conditions a phenolic compound, an aldehyde and furfuryl alcohol in an organic medium which forms an azeotrope with water in the presence of a divalent metallic salt soluble in said organic medium with continuous removal of the water of condensation from the reaction mixture.

4,255,555

TRANSESTERIFICATION PROCESS FOR PREPARATION OF LINEAR POLYESTERS

Gideon Salee, Williamsville, and Jerold C. Rosenfeld, Tonawanda, both of N.Y., assignors to Hooker Chemicals & Plastics Corp., Niagara Falls, N.Y.

Filed Jun. 4, 1979, Ser. No. 45,461
Int. Cl.³ C08G *63/18, 63/20*
U.S. Cl. 528—179 **17 Claims**

1. In the process of preparing a linear aromatic polyester by the transesterification polymerization reaction of a mixture of a bisphenol and a diaryl ester of a dicarboxylic acid wherein the molar proportion of the bisphenol and the diaryl ester ranges from about 5 molar percent insufficiency of the diaryl ester over the stoichiometric equivalent proportion of the bisphenol and the diaryl-ester to an excess of the diaryl ester over said stoichiometric proportion, the improvement wherein the diaryl ester is mixed with and transesterified with a minor molar proportion of a saturated aliphatic hydrocarbon monofunctional alcohol of 8 to 45 carbon atoms prior to any reaction of the bisphenol reactant and the diaryl ester reactant, said proportion of the alcohol being based on the molar amount of the diaryl ester reactant employed in the polymerization reactant.

4,255,556

PREPARATION OF POLY(ESTER CARBONATE) BY INTERFACIAL METHOD

Leon Segal, Randolph, and Bruce T. DeBona, Madison, both of N.J., assignors to Allied Chemical Corporation, Morris Township Morris County, N.J.

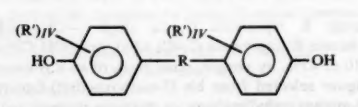
Filed Apr. 12, 1979, Ser. No. 29,422
Int. Cl.³ C08G *63/64*
U.S. Cl. 528—190 **13 Claims**

1. An interfacial process of producing a substantially amorphous, melt processible poly(ester carbonate) which comprises:

(1) mixing with an aqueous bisphenolate solution having a pH of at least about 8, (a) phosgene and (b) an organic solution of an acid halide which solution is immiscible with the aqueous bisphenolate solution,

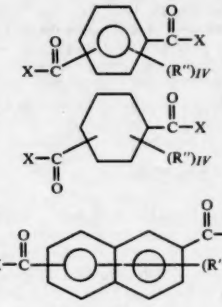
at a temperature and for a sufficient time and under sufficient agitation to react said phosgene and said acid halide with said bisphenolate to form an amorphous polymer,

said aqueous bisphenolate being an alkali metal or alkaline earth metal salt of at least one bisphenol of the formula



where R is alkylene of 1-4 carbons, —O—, —S—, $—SO_2—$, —CO— or a single bond, and R′ is indepen-

dently at each occurrence, H, Cl, Br, F, alkyl, phenyl or halogenated alkyl; said acid halide being at least one compound of the formula



with X being Cl or Br, the acid halides being meta or para or 2,6 or 2,7 and R'' being independently at each occurrence, H, Cl, Br, F, alkyl, phenyl or halogenated alkyl;

the overall molar ratio of phosgene to acid halide being between about 0.2:1 and about 20:1;

the molar ratio of bisphenolate to acid halide plus phosgene being between about 1:1 and about 1.0:1.2; and

at least about 20% of phosgene as a mole percentage of the acid halide being mixed with the aqueous bisphenolate no later than the mixing of the acid halide with the bisphenolate;

(2) separating the aqueous phase and the organic phase;

(3) washing the organic phase with aqueous liquid; and

(4) recovering the substantially amorphous, melt processable poly(ester carbonate) polymer from the washed organic phase.

4,255,557

PREPARING POLYCARBONATE OLIGOMERS BY REACTING PHOSGENE WITH AN AQUEOUS SOLUTION CONTAINING A SALT OF A DIHYDRIC PHENOL IN AN ORGANIC SOLVENT WHICH COMPRISES PREVIOUSLY COOLING THE AQUEOUS SOLUTION AND CARRYING OUT THE REACTION AT A LOW TEMPERATURE

Takeaki Megumi, Sakai; Hiroyuki Yoshizaki, and Sigeo Kondoh, both of Toyonaka, all of Japan, assignors to Mitsubishi Gas Chemical Company, Inc., Japan

Filed Oct. 3, 1979, Ser. No. 81,616

Int. Cl.[3] C08G *63/62*

U.S. Cl. 528—196 **3 Claims**

1. A process for preparing polycarbonate oligomers by reacting phosgene with an alkaline aqueous solution containing an alkali metal salt or alkaline earth metal salt of a dihydric phenol in the presence of an inert organic solvent, which comprises previously cooling said alkaline aqueous solution to not higher than 0° C., reacting the cooled aqueous solution with phosgene to perform a phosgenation reaction and also to absorb the heat of the phosgenation reaction by the quantity of heat that said cooled aqueous solution has, thereby to adjust the phosgenation reaction system substantially to not higher than 10° C., and then oligomerizing the phosgenation product at a temperature of 15° C. or higher.

4,255,558

SELF-CURING THERMOSETTING POWDER PAINTS

Edward T. Turpin, Elyria, Ohio, assignor to SCM Corporation, New York, N.Y.

Filed Jun. 18, 1979, Ser. No. 49,219

Int. Cl.[3] C08L *61/26*

U.S. Cl. 528—245 **9 Claims**

6. In a process for producing a one-component thermosetting powder paint composition having a tack temperature greater than 70° C. and adapted to be aplied to a substrate and heat fused into a crosslinked surface coating, the improvement in the process comprising:

providing a self-curing glycoluril copolymer comprising by weight between 8% and 70% glycoluril and having a molecular weight between 400 and 4000 by coreacting a tetra-methylol or tetra-alkoxy methyl glycoluril with a reactive material containing reactive hydroxyl, carboxyl, or amide groups by partial condensation to provide a self-curing glycoluril copolymer having between 0.5 and 2 equivalents of reactive alkoxy methyl or methylol groups per 1 equivalent of reactive hydroxyl, carboxyl, or amide group.

4,255,559

TRANSPARENT COPOLYAMIDE FROM 1,10-DISUBSTITUTED-1,10 DIAMINE

Josef Pfeifer, Therwil, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

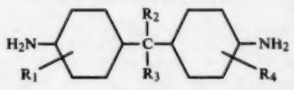
Filed Oct. 9, 1979, Ser. No. 83,145

Claims priority, application Switzerland, Oct. 18, 1978, 10774/78

Int. Cl.[3] C08G *69/26*

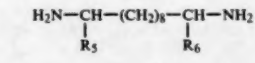
U.S. Cl. 528—338 **8 Claims**

1. A transparent copolyamide having a reduced specific viscosity of at least 0.5 dl/g, measured on a 0.5% solution in m-cresol at 25° C., which copolyamide is obtained by reaction of a mixture (A) consisting of essentially stoichiometric amounts of a diamine of the formula I



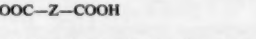
(I)

and isophthalic acid, or an amide-forming derivative thereof, or a mixture of isophthalic acid and terephthalic acid, or amide-forming derivatives thereof, in a molar ratio of isophthalic acid(derivative) : terephthalic acid(derivative of 5:5 to 10:0, with a mixture (B) consisting of essentially stoichiometric amounts of a diamine of the formula II



(II)

and a dicarboxylic acid of the formula III



(III)

or an amide-forming derivative thereof, wherein

R_1 to R_4 independently of one another are each hydrogen or alkyl having 1–4 C atoms,

R_5 and R_6 independently of one another are each cycloalkyl which has 5–12 ring C atoms and which is unsubstituted or substituted by C_{1-4}-alkyl, or they are each isopropyl, sec-butyl, isobutyl or $—CH(R_7)(R_8)$, is hydrogen or alkyl having 2–8 C atoms,

R_8 is alkyl having 2–8 C atoms, and

Z is alkylene having 4–14 C atoms,

and the proportion of mixture A) if R_5 and R_6 independently of one another are each cycloalkyl which has 5–12 ring C atoms

and which is unsubstituted or substituted by C_{1-4}-alkyl, or they are each isopropyl, sec-butyl or isobutyl, is 40–60 percent by weight, based on the total copolyamide and if R_5 and R_6 independently of one another are each a group $—CH(R_7)(R_8)$ it is 50–70 percent by weight, based on the total copolyamide with these weight percentages in the case of amide-forming derivatives of isophthalic acid, of terephthalic acid or of a dicarboxylic acid of the formula III relating to identical functional groups.

4,255,560

TRANSPARENT COPOLYAMIDES FROM 2,4'-PACM

Rolf-Volker Meyer; Rolf Dhein; Friedrich Fahnler; Dietrich Michael; Hans Rudolph, and Werner Nielinger, all of Krefeld, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Fed. Rep. of Germany

Filed Dec. 12, 1979, Ser. No. 102,987

Claims priority, application Fed. Rep. of Germany, Dec. 23, 1978, 2855928

Int. Cl.³ C08G *69/26*

U.S. Cl. 528—339 **7 Claims**

1. A thermoplastic copolyamide consisting essentially of a polymeric condensation product of equimolar quantities of:

(I) at least one member selected from the group consisting of aliphatic dicarboxylic acids having from 2 to 20 carbon atoms and aromatic dicarboxylic acids having from 7 to 20 carbon atoms and

(II) an amine mixture comprising:

(1) from 0.1 to 100 mole percent of a mixture of cycloaliphatic amines consisting of

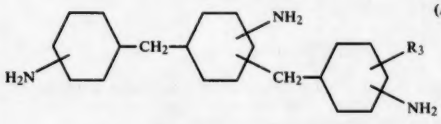
(a) from 0 to 3 mole percent of 4-aminodicyclohexyl methane,

(b) from 70 to 99 mole percent of 4,4'-diaminodicyclohexyl methane,

(c) from 1 to 30 mole percent of 2,4'-diaminodicyclohexyl methane,

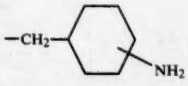
(d) from 0 to 2 mole percent of 2,2'-diaminodicyclohexyl methane and

(e) from 0 to 15 mole percent of a polynuclear polyamine of the formula



(A)

wherein R_3 is hydrogen or



and

(2) from 0 to 99.9 mole percent of one or more aliphatic diamines or cycloaliphatic diamines other than defined in (1) and having at least 6 carbon atoms,

the sum of each of (1) and (2) and of (a) to (e) being 100 mole percent.

4,255,561

SULFIDE POLYMERS OF POLYOXYALKYLENES

Lindley S. Wood, Montclair; David J. Tracy, Lincoln Park, and Paritosh M. Chakrabarti, Wayne, all of N.J., assignors to GAF Corporation, New York, N.Y.

Filed Sep. 25, 1979, Ser. No. 78,709

The portion of the term of this patent subsequent to Mar. 31, 1998, has been disclaimed.

Int. Cl.³ C08G *75/14*

U.S. Cl. 528—388 **20 Claims**

1. A sulfide polymer of polyoxyalkylene having the formula:

$$MS—\{[(AO)_x—(BO)_y—(CO)_z]_n—D—S—\}_m—M$$

where M is alkyl of from 1 to 4 carbon atoms, benzyl, phenyl, hydrogen or an alkali metal or ammonium ion; A, C and D represent lower alkylene of 2 to 4 carbon atoms; B is alkylene of 2 to 8 carbon atoms; y and z are each integers having a value of from 0 to 50; x is an integer having a value of from 1 to 50; n is an integer having a value of 1 to 30; and m has a value of from 2 to 10.

13. The process of which comprises reacting at an elevated temperature and pressure a concentrated mixture of a sulfur-containing compound selected from the group of ammonium thiol; alkali metal thiol; alkali metal sulfide and ammonium sulfide with at least one dihalide compound having the formula:

$$halo\text{-}[(AO)_x—(BO)_y—(CO)_z]_n\ D\text{-}halo$$

wherein halo is an atom of chlorine, bromine or iodine; A, C and D represent lower alkylene of 2 to 4 carbon atoms; B is alkylene of 2 to 8 carbon atoms; y and z each represent integers having value of from 0 to 50 and x represents an integer having a value of from 1 to 50; and n an integer from 1 to 30; to produce the product of claim 1.

4,255,562

CRYSTALLINE CO-POLYBENZYLS

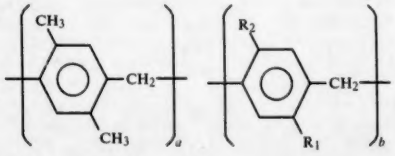
John E. Chandler, Stamford, Conn., and Robert W. Lenz, Amherst, Mass., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Mar. 29, 1979, Ser. No. 25,225

Int. Cl.³ C08G *61/02*

U.S. Cl. 528—397 **5 Claims**

1. Crystalline random copolybenzyl represented by the structural formula:



wherein R_1 and R_2 are the same or different C_1–C_6 alkyl groups, and when one of R_1 or R_2 is methyl, the other of R_1 or R_2 is a C_2–C_6 alkyl group, a is 98.9% to about 82 mol percent and b is 1.1 to about 18 mol percent.

4,255,563

PROCESS FOR PREPARING ANTHOCYANS FROM CORRESPONDING FLAVONOID GLYCOSIDES

Kazuo Wakihira; Satoshi Kikumoto; Hiroshi Kigawa; Osamu Nozaki, all of Shiga, and Michio Minami, Moriyama, all of Japan, assignors to Shiraimatsu Shinyaku Company, Ltd., Shiga, Japan

Filed Feb. 2, 1979, Ser. No. 9,059
Claims priority, application Japan, Apr. 12, 1978, 53-43700
Int. Cl.[3] C07H *17/04*
U.S. Cl. 536—8 3 Claims

1. A process for preparing anthocyans from their corresponding flavonoid glycosides which comprises reducing the flavonoid glycosides with concentrated hydrochloric acid and a metal selected from the group consisting of magnesium and zinc at temperatures not higher than 30° C. under acidic conditions, precipitating the anthocyans formed from said reduction reaction as a metal salt by neutralizing the reaction solution with an alkali and isolating the free anthocyans by decomposing said metal salt with concentrated hydrochloric acid.

2. A process in accordance with claim 1, wherein said flavonoid glycosides are selected from the group consisting of rutin and myricitrin.

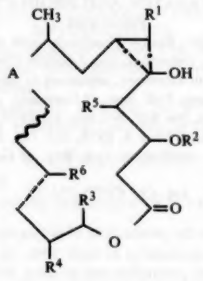
4,255,564

NOVEL MACROLACTONE DERIVATIVES AND PROCESS OF PRODUCING THEM

Sumio Umezawa; Hamao Umezawa, and Kuniaki Tatsuta, all of Tokyo, Japan, assignors to Zaidan Hojin Biseibutsu Kagaku Kenkyu Kai, Tokyo, Japan

Division of Ser. No. 883,301, Mar. 3, 1978, Pat. No. 4,196,280.
This application Sep. 12, 1979, Ser. No. 75,036
Claims priority, application Japan, Mar. 9, 1977, 52/25618; Mar. 9, 1977, 52/25619; May 12, 1977, 52/55125
Int. Cl.[3] C07H *17/08;* C07D *313/00*
U.S. Cl. 536—17 R 21 Claims

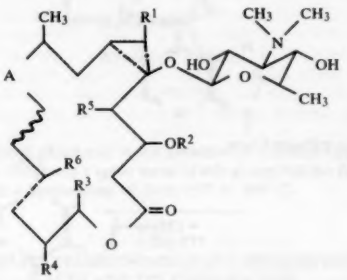
1. The aglycone of a macrolide compound represented by the formula



wherein A represents a carbonyl group or

group; R represents a member selected from the group consisting of a hydrogen atom, an acetyl group, a propionyl group, a butyryl group, an isobutyryl group and an isovaleryl group, or a forosaminyl group; R^1 represents an aldehyde group protected by a cyclic acetal or thioacetal; R^2 represents a hydrogen atom or an acyl group; R^3 represents a lower alkyl group; R^4 represents a hydrogen atom, hydroxymethyl group; or a mycinosyloxymethyl group; R^5 represents a methyl group or a methoxy group; R^6 represents a hydrogen atom or a methyl group; — represents a single bond or a double bond; ⋯ represents a single bond, a double bond, or an oxiran-2,3-diyl group; and ⌒ means that the macrolactone ring forms a 16-membered ring or a 17-membered ring.

2. A macrolide compound represented by the formula



wherein A,R^1,R^2,R^3,R^4,R^5 and R^6 are same as in claim 1.

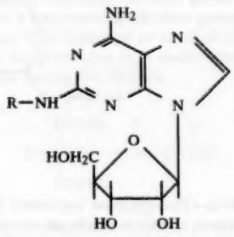
4,255,565

PRODUCTION OF 2,6-DIAMINONEBULARINES

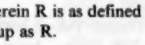
Ryuji Marumoto; Shunsuke Shima, both of Minoo, and Yoshiyasu Furukawa, Toyonaka, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

Filed Oct. 20, 1978, Ser. No. 953,255
Claims priority, application Japan, Oct. 21, 1977, 52-127147
Int. Cl.[3] C07H *17/00*
U.S. Cl. 536—24 10 Claims

1. A method for producing a compound of the formula



wherein R is phenyl, substituted phenyl, cyclohexyl or substituted cyclohexyl the substituent being halogen, lower alkyl or lower alkoxy, or an acid addition salt thereof, which comprises reacting 5-amino-1-β-D- ribofuranosyl-4-cyanoimidazole with a compound of the formula:



wherein R is as defined above and R^4 is hydrogen or the same group as R.

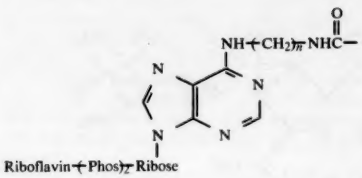
4,255,566

FLAVIN ADENINE DINUCLEOTIDE DERIVATIVES AND LABELED CONJUGATES PREPARED THEREFROM

Robert J. Carrico, and Richard D. Johnson, both of Elkhart, Ind., assignors to Miles Laboratories, Elkhart, Ind.

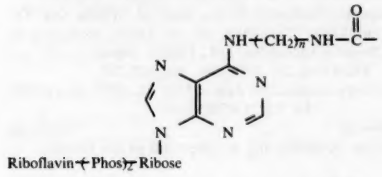
Filed Feb. 19, 1980, Ser. No. 122,292
Int. Cl.[3] C07H *19/20, 17/00*
U.S. Cl. 536—27 10 Claims

3. A flavin adenine dinucleotide-labeled theophylline conjugate of the formula:



wherein Riboflavin–(–Phos–)$_n$Ribose represents the riboflavin-pyrophosphate-ribose residue in flavin adenine dinucleotide and n is an integer from 2 through 10.

5. A flavin adenine dinucleotide-labeled phenytoin conjugate of the formula:



wherein Riboflavin–(–Phos–)$_n$Ribose represents the riboflavin-pyrophosphate-ribose residue in flavin adenine dinucleotide, ϕ is phenyl, n is an integer from 2 through 10, and m is an integer from 2 through 6.

4,255,567

PROCESS FOR PRODUCING NBR WITH OCTYL-TO DECYL SULFATES

Nagatosh Sugi, Yokohama, and Tetsu Ohishi, Tokyo, both of Japan, assignors to Nippon Zeon Co. Ltd., Tokyo, Japan

Filed Feb. 13, 1979, Ser. No. 11,921

Claims priority, application Japan, Feb. 14, 1978, 53/15631

Int. Cl.[3] **C08F** *2/26, 220/44*

U.S. Cl. 526—225 **5 Claims**

1. A process for producing an acrylonitrilebutadiene copolymer rubber by emulsion polymerization which, when coagulated, provides solid copolyer crumbs having a particle size greater than 20 mesh, said process comprising emulsion polymerizing acrylonitrile and butadiene in an aqueous emulsion system consisting essentially of water, acrylonitrile in an amount sufficent to provide at least 10% by weight of combined acrylonitrile in the copolymer, butadiene, and an emulsifier system comprising at least 60% by weight of a linear alkyl sulfate having 8 to 10 carbon atoms.

4,255,568

2H-PYRIMIDO[4,5-D][1,3]OXAZINE-2,4(1H)-DIONE DERIVATIVES

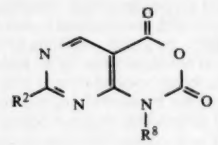
Anthony C. Scotese, King of Prussia; Robert L. Morris, Devon, and Arthur A. Santilli, Havertown, all of Pa., assignors to American Home Products Corporation, New York, N.Y.

Division of Ser. No. 31,256, Apr. 18, 1979, Pat. No. 4,215,216. This application Oct. 29, 1979, Ser. No. 89,652

Int. Cl.[3] **C07D** *498/04*

U.S. Cl. 544—91 **11 Claims**

1. A compound of the formula:



in which

R^2 is hydrogen, hydroxyl, alkyl of 1 to 6 carbon atoms, alkylthio of 1 to 6 carbon atoms, phenyl, 4-methoxyphenyl, 4-chlorophenyl, 1-pyrrolidinyl or methylphenylamino;

and

R^8 is hydrogen, alkyl of 1 to 6 carbon atoms, 2-alkoxyethyl of 3 to 6 carbon atoms, allyl, propargyl, phenyl, 4-methoxyphenyl, 4-chlorophenyl, benzyl, 4-methoxybenzyl, 4-chlorobenzyl, 4-(4-morpholinyl)phenyl or piperonyl.

4,255,569

PROCESS FOR THE PRODUCTION OF ISOCYANURATE POLYISOCYANATES, AND PRODUCTS BY THE PROCESS

Hans-Jürgen Müller; Rudolf Hombach, both of Cologne; Manfred Dollhausen, Odenthal, and Joachim Zirner, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Continuation of Ser. No. 832,497, Sep. 12, 1977, abandoned. This application May 4, 1979, Ser. No. 36,128

Claims priority, application Fed. Rep. of Germany, Sep. 15, 1976, 2641380

Int. Cl.[3] **C07D** *251/34*

U.S. Cl. 544—193 **3 Claims**

1. A process for the production of polyisocyanates of isocyanurate structure containing at least 50%, by weight, of trisisocyanatomonoisocyanurates and at most 3%, by weight, of diisocyanate free from isocyanurate groups comprising:

(a) catalytically trimerizing organic diisocyanates free from isocyanurate groups, selected from the group consisting of 2,4-diisocyanatotoluene, 2,6-diisocyanatotoluene, and 1-isocyanato-3,3,5-trimethyl-5-isocyanatomethyl cyclohexane and mixtures thereof,

(b) terminating the trimerization reaction by deactivation of the catalyst after from 5 to 40% of the isocyanate groups of the isocyanurate-free diisocyanate have been trimerized, and

(c) removing the unreacted isocyanurate-free diisocyanate present in the reaction mixture from the reaction mixture by distillation, said distillation being carried out in the presence of from 1, to 30%, by weight, based on the end product obtained as distillation residue, of a liquid distillation aid which is inert under the distillation conditions and which boils at a temperature at least 50° C. above the boiling point of the isocyanurate-free diisocyanate.

4,255,570
POLYISOCYANATE REACTION PRODUCTS OF DIISOCYANATES AND S-TRIAZINE DERIVATIVES CONTAINING AMINO GROUPS

Gerhard Grögler, Leverkusen, and Holger Meyborg, Odenthal-Gloebusch, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

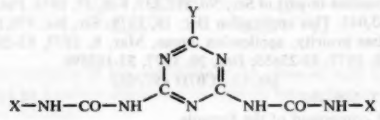
Filed Aug. 3, 1978, Ser. No. 930,611

Claims priority, application Fed. Rep. of Germany, Aug. 19, 1977, 2737402

Int. Cl.³ C07D *251/54, 251/48, 251/46, 251/70*

U.S. Cl. 544—197 **2 Claims**

1. A polyisocyanate of the formula:



wherein

x represents a radical obtained by removing the more reactive isocyanate group from an organic diisocyanate containing isocyanate groups of different reactivity; and

Y represents a chlorine, bromine, C_1–C_8 alkyl, C_1–C_8 alkoxy, C_6–C_{10} aryl, C_6–C_{10} aroxy radical or a radical corresponding to the formula:

—NH—CO—NH—X.

4,255,571
CATALYTIC DEHYDROGENATION PREPARATION OF 3-PYRIDAZONES

Werner H. Müller, Eppstein/Taunus, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

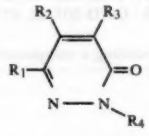
Filed Dec. 20, 1978, Ser. No. 971,431

Claims priority, application Fed. Rep. of Germany, Dec. 24, 1977, 2757923

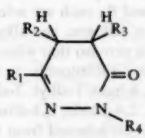
Int. Cl.³ C07D *237/14*

U.S. Cl. 544—239 **15 Claims**

1. A process for the preparation of a 3-pyridazone of the formula



wherein R_1 to R_4, which are the same or not all the same, each is hydrogen, unsubstituted alkyl, alkyl mono-substituted by halogen, alkyl mono-substituted by phenyl, alkyl mono-substituted by naphthyl, alkyl mono-substituted by hydroxy, alkyl mono-substituted by alkoxy or alkyl mono-substituted by trifluoromethyl, said alkyl being straight chain, branched or cyclic, aryl, aryl mono-substituted by halogen, aryl mono-substituted by hydroxy, aryl mono-substituted by alkoxy of up to 6 carbon atoms, aryl mono-substituted by alkyl of up to 6 carbon atoms, aryl mono-substituted by trifluoromethyl or aryl mono-substituted by pentafluoroethyl, which comprises heating a 4,5-dihydro-3-pyridazone of the formula



in the liquid phase and in the presence of a dehydrogenation catalyst containing a noble metal of sub-group 8 of the Periodic Table, to a temperature of from 150° to 350° C.

4,255,572
N,N-DIALKYLUREIDOMETHANE DIPHOSPHONIC ACID AND ITS PREPARATION

Friedrich Kruger, Erzberger Strasse 27, 6803 Edington, and Walter Michel, Kallstadter Strasse 10, 6804 Ilvesheim, both of Fed. Rep. of Germany

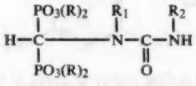
Filed Jul. 19, 1979, Ser. No. 58,806

Claims priority, application Fed. Rep. of Germany, Sep. 2, 1978, 2838437

Int. Cl.³ C07F *9/38, 9/65;* **C02B** *5/06*

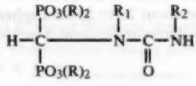
U.S. Cl. 544—243 **5 Claims**

1. N,N'-dialkylureidomethane diphosphonic acids or their alkaline salts having the formula:



wherein R_1 and R_2 represent an alkyl group having 1 to 3 carbon atoms or a ring forming alkylene group having 2 or 3 carbon atoms and R is hydrogen or an alkali metal.

2. A process for producing N,N'-dialkylureidomethane diphosphonic acids having the formula:



wherein R_1 and R_2 represent an alkyl group having 1 to 3 carbon atoms or a ring forming alkylene group having 2 or 3 carbon atoms and R is hydrogen or an alkali metal, said method comprising reacting formic acid with a corresponding N,N'-disubstituted urea and phosphorus trichloride.

4,255,573
IMIDAZOINDOLE DERIVATIVES AND PHARMACEUTICAL COMPOSITIONS COMPRISING IMIDAZOINDOLE DERIVATIVES

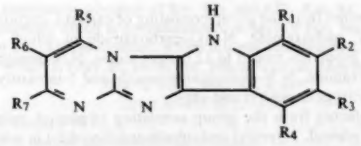
Parimal K. Adhikary, 6606 Wilhugh Pl., Nashville, Tenn. 37209

Filed Mar. 29, 1979, Ser. No. 25,076

Int. Cl.³ A61K *31/505;* **C07D** *487/14*

U.S. Cl. 544—247 **2 Claims**

1. A compound selected from the group of 5H-pyrimido(2',1':2,3)imidazo(4,5-b)indole derivatives having the formula



I

and pharmaceutically acceptable acid solution salts thereof wherein R_1, R_2, R_3, and R_4 each are selected from the group consisting of hydrogen, halogen, and alkyl having one to four carbon atoms, with the proviso that when taken together they constitute the following substituents on the tetracyclic ring, 1-halo, 2-halo, 3-halo, 4-halo, 1-alkyl, 2-alkyl, 3-alkyl, 4-alkyl, 1,3-dihalo, 2,3-dihalo, 2,4-dihalo, 3,4-dihalo, 1,3-di-alkyl, 2,3-di-alkyl, 1,4-di-alkyl; R_5 is selected from the group consisting of hydrogen and alkyl containing one to four carbon atoms, and R_6 and R_7 each are selected from the group consisting of hydrogen and halo.

4,255,574

PROCESS FOR PREPARING 2,4-DIAMINO-PYRIMIDINES

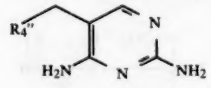
Perry Rosen, North Caldwell, N.J., assignor to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 805,506, Jun. 10, 1977, Pat. No. 4,143,227, which is a continuation of Ser. No. 564,518, Apr. 2, 1975, abandoned, which is a continuation of Ser. No. 336,094, Feb. 26, 1973, abandoned. This application Dec. 8, 1978, Ser. No. 967,676

Int. Cl.³ C07D *239/48*

U.S. Cl. 544—323 **1 Claim**

1. A process for preparing a compound of the formula



wherein R_4'' is lower alkoxy or benzyloxy, which comprises reacting a β-alkoxy-propionitrile of the formula

$R_4''CH_2CH_2CN$

wherein R_4'' is as previously described, with a methylformate in the presence of an alkali metal alcoholate at a temperature in the range of from about 25° to about 100° C. and at a pressure in the range of from about 20 to 50 atmospheres, and condensing the resulting α-alkoxy-methylene-β-methoxy-propionitrile with guanidine.

4,255,575

2-HYDROXY-5-(1-HYDROXY-2-PIPERAZINYLETHYL)-BENZOIC ACID DERIVATIVES

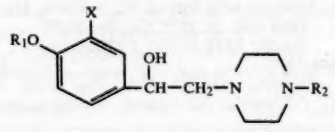
J. Martin Grisar, and George P. Claxton, both of Cincinnati, Ohio, assignors to Richardson-Merrell Inc., Wilton, Conn.

Filed May 4, 1979, Ser. No. 36,244

Int. Cl.³ C07D *295/08, 401/04*

U.S. Cl. 544—394 **6 Claims**

1. A derivative of 2-hydroxy-5-(1-hydroxy-2-piperazinylethyl)benzoic acid having the formula



wherein

X is selected from the group consisting of carboxy, carbomethoxy, carboxamide, N-alkylcarboxamide in which the alkyl group has from 1 to 12 carbon atoms, N,N-dimethylcarboxamide, N,N-diethylcarboxamide and 5-tetrazolyl;

R_1 is hydrogen, methyl and ethyl;

R_2 is selected from the group consisting of phenyl, substituted phenyl, 2-pyridyl and substituted-2-pyridyl in which said substitution is lower alkyl and lower alkoxy having from 1 to 4 carbon atoms, fluorine, chlorine and trifluoromethyl;

and the pharmaceutically acceptable acid addition salts thereof.

4,255,576

1-AZAXANTHONE DERIVATIVES

Akira Nohara, Kyoto; Hirosada Sugihara, Osaka, and Kiyoshi Ukawa, Toyonaka, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

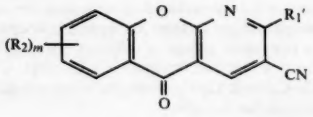
Continuation-in-part of Ser. No. 881,237, Feb. 27, 1978, Pat. No. 4,143,042. This application Dec. 18, 1978, Ser. No. 970,105

Claims priority, application Japan, Mar. 8, 1977, 52-25654; Mar. 8, 1977, 52-25655; Dec. 20, 1977, 52-153898

Int. Cl.³ C07D *491/052*

U.S. Cl. 546—92 **23 Claims**

1. A compound of the formula



wherein:

m is 1 or 2;

R'_1 is hydrogen, C_{1-6} alkyl, phenyl C_{1-6} alkoxy-carbonyl, hydroxy, C_{1-4} alkoxy, amino or C_{1-3} alkylamino; and

each R_2 is independently C_{1-6} alkyl, C_{1-4} alkoxy, halogen, nitro, hydroxy, carboxy, amino, C_{1-3} alkylamino or di(C_{1-3} alkyl) amino.

4,255,577

PROCESS AND INTERMEDIATES FOR PREPARING 3-[4-(DISUBSTITUTED-AMINO)PHENYL] OR (9-JULOLIDINYL)-3-(DIPHENYLAMINO)PHTHALIDES

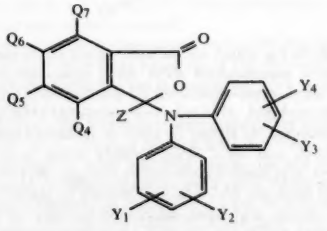
Paul J. Schmidt, Sharonville, and William M. Hung, Cincinnati, both of Ohio, assignors to Sterling Drug Inc., New York, N.Y.

Division of Ser. No. 19,594, Mar. 12, 1979, Pat. No. 4,200,313, which is a division of Ser. No. 942,996, Sep. 18, 1978, Pat. No. 4,187,223, which is a continuation-in-part of Ser. No. 821,927, Aug. 4, 1977, Pat. No. 4,168,378, which is a continuation-in-part of Ser. No. 755,183, Dec. 29, 1976, abandoned. This application Aug. 27, 1979, Ser. No. 69,979

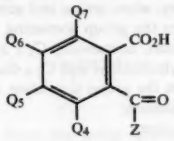
Int. Cl.³ C07D *307/83, 455/00*

U.S. Cl. 546—94 **6 Claims**

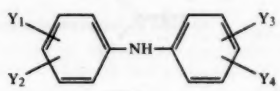
1. A process for producing a compound having the formula



which comprises reacting a 2-substituted benzoic acid having the formula



with a diarylamine having the formula



in the presence of the anhydride of an alkanoic acid having from 2 to 5 carbon atoms and an organic base, wherein in the above formulas:

Q_4 is hydrogen or halo;

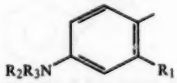
Q_5 is the same as Q_4; or di-lower-alkylamino, halo or COX when Q_4, Q_6 and Q_7 are each hydrogen;

Q_6 is the same as Q_4; or di-lower-alkylamino, halo or COX when Q_4, Q_5 and Q_7 are each hydrogen;

Q_7 is the same as Q_4;

X is hydroxyl, benzyloxy or alkoxy having from 1 to 18 carbon atoms;

Z is a radical having the formula



in which:

R_1 is selected from the group consisting of hydrogen, halo, lower-alkyl, lower-alkoxy and di-lower-alkylamino;

R_2 is lower-alkyl; and

R_3 is selected from the group consisting of lower-alkyl, benzyl, phenyl and phenyl substituted with a lower-alkyl or lower-alkoxy group; and

Y_1, Y_2, Y_3 and Y_4 are the same or different and are selected from the group consisting of hydrogen, halo, hydroxyl, lower-alkoxy, alkyl having from 1 to 9 carbon atoms, phenyl-lower-alkyl, $COOR_4$ and NR_5R_6 where R_4 and R_5 are hydrogen or lower-alkyl and R_6 is hydrogen, lower-alkyl, cycloalkyl having from 5 to 7 carbon atoms, lower-alkanoyl, phenylsulfonyl or lower-alkyl-substituted phenylsulfonyl.

4,255,578

SYNTHESIS OF PERHALOMETHYLCARBINOL-SUBSTITUTED PHENOL AND NAPHTHOL SULFAMPHTHALEIN DYES FROM THE CORRESPONDING TRIACYLATED DERIVATIVES

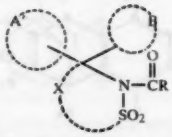
Louis Cincotta, and James W. Foley, both of Andover, Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed Nov. 2, 1978, Ser. No. 956,907

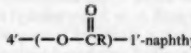
Int. Cl.³ C07D *275/04*

U.S. Cl. 546—96 **39 Claims**

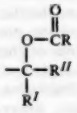
23. A compound of the formula



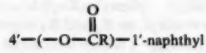
wherein A′ is selected from a



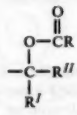
moiety substituted in the 3′-position with a group,



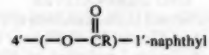
wherein R is alkyl or aryl, R^I is perhalomethyl and R^{II} is hydrogen or perhalomethyl and a



moiety substituted in the 3′-position with a group,



wherein R, R^I and R^{II} have the same meaning given above; B is a phenyl moiety or a naphthyl moiety provided B is a phenyl moiety when said A′ is said



moiety and X represents the atoms necessary to complete a ring-closing moiety selected from a sulfamphthalein moiety and a sulfamnaphthalein moiety.

4,255,579

11-SUBSTITUTED HEXAHYDRO-2,6-METHANO-3-BENZAZOCINES

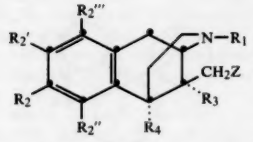
William F. Michne, Poestenkill, N.Y., assignor to Sterling Drug Inc., New York, N.Y.

Continuation-in-part of Ser. No. 877,166, Feb. 13, 1978, Pat. No. 4,180,667, which is a continuation-in-part of Ser. No. 741,227, Nov. 12, 1976, Pat. No. 4,100,164, which is a continuation-in-part of Ser. No. 695,977, Jun. 14, 1976, abandoned, which is a continuation-in-part of Ser. No. 576,313, May 12, 1975, abandoned, which is a continuation-in-part of Ser. No. 471,571, May 20, 1974, Pat. No. 3,932,422. This application Feb. 5, 1979, Ser. No. 9,594

Int. Cl.³ C07D *221/26*

U.S. Cl. 546—97 **27 Claims**

1. A compound having the formula



where R_1 is hydrogen, lower-alkyl, lower-alkanoyl (only when R_4 is hydrogen), lower-alkenyl, lower-alkynyl, halo-lower-alkenyl, cyclo-lower-alkyl, cyclo-lower-alkyl-lower-alkyl, 2- or 3-furylmethyl, or such 2- or 3-furylmethyl substituted on the unsubstituted ring carbon atoms by from one to three methyl groups, phenyl-lower-alkyl, or phenyl-lower-alkyl substituted in the phenyl ring by from one to two members of the group consisting of halogen, lower-alkyl, hydroxy, lower-alkanoyloxy, lower-alkoxy, lower-alkylmercapto, trifluoromethyl, amino, lower-alkanoylamino or a single methylenedioxy attached to adjacent carbon atoms; R_2, R_2', R_2'' and R_2''' are each hydrogen, or three of them are hydrogen and the fourth is halogen, lower-alkyl, hydroxy, lower-alkanoyloxy, lower-alkoxy, lower-alkylmercapto, trifluoromethyl, nitro, amino, lower-alkanoylamino, lower-alkoxycarbonylamino or phenyl, or two of the adjacent such groups together are methylenedioxy; R_3 is hydrogen or lower-alkyl; R_4 is hydrogen, lower-alkyl, lower-alkoxy-lower-alkyl, hydroxy-lower-alkyl, lower-alkylthio-lower-alkyl, lower-alkylsulfinyl-lower-alkyl, phenylthio-lower-alkyl, phenylsulfinyl-lower-alkyl, lower-alkenyl or halolower-alkyl, or R_3 and R_4 together are divalent lower-alkylene, $-(CH_2)_n-$, where n is one of the integers 3 or 4; and Z is the group

or the ethylene glycol ketal thereof, where R_5 is hydrogen, lower-alkyl, cyclo-lower-alkyl-lower-alkyl, phenyl or phenyl-lower-alkyl; and R_8 is hydrogen or lower-alkyl; or an acid-addition salt thereof.

4,255,580

SUBSTITUTED 2,3-ALKYLENE BIS (OXY) BENZAMIDES AND DERIVATIVES

Michel L. Thominet; Gérard C. Bulteau, both of Paris; Jacques H. Acher, Itteville, and Claude H. Collignon, Saint Remy les Chevreuse, all of France, assignors to Siociete d'Etudes Scientifiques et Industrielles de L'ile-de-France, Paris, France

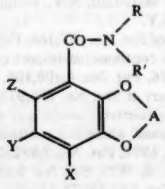
Division of Ser. No. 821,123, Aug. 2, 1977, Pat. No. 4,186,135. This application Feb. 23, 1979, Ser. No. 14,785

Claims priority, application France, Aug. 4, 1976, 76 23835

Int. Cl.[3] C07D *405/12*

U.S. Cl. 546—197 **6 Claims**

1. A substituted 2,3-alkylene bis(oxy)benzamide, its pharmaceutically acceptable acid addition salt, its quaternary ammonium salt, its oxide, or its dextrorotatory or levoratatory isomer, having the formula:



wherein:

A is a C_{1-3} alkylene group;

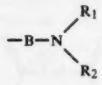
X is selected from the group consisting of hydrogen, halogen, C_{1-4} alkoxy, nitro, amino and acetamino,

Y is selected from the group consisting of hydrogen, halogen, nitro, amino, acetamino, C_{1-4} alkylsulfonyl, sulfamoyl, C_{1-4} alkylsulfamoyl and C_{1-4} dialkylsulfamoyl;

Z is selected from the group consisting of hydrogen, nitro, amino and acetamino;

R' is a hydrogen atom,

R is a group having the formula:



wherein:

B is a C_{1-3} alkylene group and

R_2 is a benzyl group when R_1 is joined with B to form a piperidinyl group or

is a piperidino group;

provided that X, Y, and Z are not all hydrogen when

is a piperidino group and further provided that when

is a piperidino group A is a C_{2-3} alkylene.

4,255,581

PROCESS FOR THE PREPARATION OF ALKYL AND ARYL ESTERS OF 3'-SUBSTITUTED AND 2', 3'-DISUBSTITUTED 2-ANILINO-3-PYRIDINECARBOXYLIC ACIDS

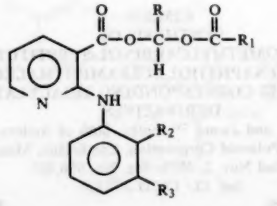
Mario A. Los, Buenos Aires, Argentina, assignor to Laboratories Bago, S.A., Capital Federal, Argentina

Filed Aug. 13, 1979, Ser. No. 66,081

Int. Cl.[3] C07D *213/80, 213/803, 405/02*

U.S. Cl. 546—269 **20 Claims**

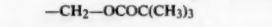
1. A process for the preparation of alkyl and aryl esters of 3-substituted and 2',3'-disubstituted 2-anilino-3-pyridinecarboxylic acids of the formula:



(I)

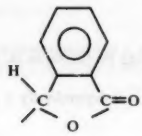
wherein the

group is selected from the group consisting of an acyloxymethyl group of formula:



(II)

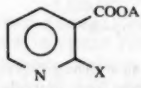
and a heterocyclic structure of formula:



(III)

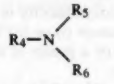
and R_2 and R_3 are each independently selected from the group consisting of hydrogen, chlorine, methyl and trifluoromethyl, which comprises;

(a) reacting a compound of the formula:



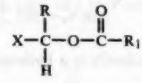
(IV)

wherein X represents halogen and A is an ammonium radical derived from an amine of the formula:



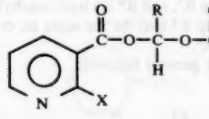
(V)

wherein R_4, R_5 and R_6 are each independently selected from the group consisting of hydrogen, acyl, alkyl and the residue of an aliphatic alcohol having 1 to 4 carbon atoms; with a compound of the formula:



(VI)

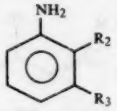
wherein R_1 and X are as previously defined; whereby there is obtained a compound of the formula:



(VII)

wherein R, R_1 and X are as previously defined; and

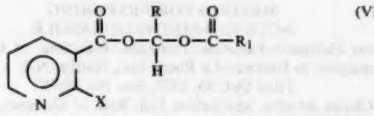
(b) reacting the compound of formula (VII) above with a compound of formula:



(VIII)

wherein R_2 and R_3 have the meaning herein before described.

16. A compound of the formula:



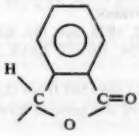
(VII)

wherein the

group is selected from the group consisting of an acyloxymethyl group of formula:

(II)

and a heterocyclic structure of formula:



(III)

and X represents halogen.

4,255,582

(−)-α-{2-[BIS(1-METHYLETHYL)AMINO]ETHYL}-α-PHENYL-2-PYRIDINEACETAMIDE AND PHARMACOLOGICALLY ACCEPTABLE SALTS THEREOF

Paul B. Sollman, Wilmette, Ill., assignor to G. D. Searle & Co., Skokie, Ill.

Filed Feb. 2, 1979, Ser. No. 8,892

Int. Cl.[3] C07D *213/56*

U.S. Cl. 546—323 **3 Claims**

1. (−)-α-{2-[Bis(1-methylethyl)amino]ethyl}-α-phenyl-2-pyridineacetamide and pharmacologically acceptable salts thereof.

4,255,583

2-ALKYLTHIOALKYL-4,5-DIALKYL-Δ^3-THIAZOLINES

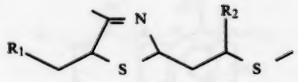
Donald A. Withycombe, Lincroft; Braja D. Mookherjee, Holmdel; Cynthia J. Mussinan, Bricktown; Manfred H. Vock, Locust, and Christopher Giacino, Califon, all of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Continuation-in-part of Ser. No. 730,156, Oct. 7, 1976, abandoned. This application Mar. 5, 1979, Ser. No. 17,579

Int. Cl.[3] C07D *277/08*

U.S. Cl. 548—146 **5 Claims**

1. A 2-alkylthioalkyl-4,5-dialkyl-Δ^3-thiazoline having the structure:



wherein R_1 and R_2 are the same or different and are either hydrogen or methyl.

4,255,584

METHOD FOR PREPARING 5-CYANO-4-METHYL-OXAZOLE

Hans Hoffmann-Paquotte, Inzlingen, Fed. Rep. of Germany, assignor to Hoffman-La Roche Inc., Nutley, N.J.

Filed Oct. 30, 1979, Ser. No. 89,757

Claims priority, application Fed. Rep. of Germany, Nov. 2, 1978, 2847625; Switzerland, Aug. 9, 1979, 7309/79

Int. Cl.³ C07D *263/36*

U.S. Cl. 548—236 **10 Claims**

1. A method for preparing 5-cyano-4-methyl-oxazole, comprising: reacting 5-carbamoyl-4-methyl-oxazole with a lower alkanecarboxylic acid anhydride in the presence of a nickel or copper catalyst to produce 5-cyano-4-methyl oxazole.

4,255,585

BENZOHETEROCYCLIC DERIVATIVES OF PHENOXYACETIC ACID

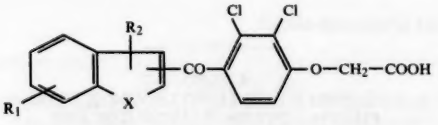
Germaine Thuillier nee Nachmias, Paris; Jacqueline S. Laforest nee Boutillier du Retail, Vincennes; Bernard J. M. Cariou, Combleux; Pierre A. R. Bessin, Chilly Mazarin; Jacqueline S. Bonnet nee Roux, and Jean E. Thuillier, both of Paris, all of France, assignors to Centre European de Recherches Pharmacologique, Arcueil, France

Filed Oct. 22, 1975, Ser. No. 624,981

Int. Cl.³ C07D *333/24, 307/77;* A61K *31/38, 31/34*

U.S. Cl. 549—58 **10 Claims**

1. A phenoxyacetic acid selected from the group consisting of a phenoxy-acetic-acid of the general formula



wherein X is oxygen or sulfur and R_1 and R_2, which are identical or different, are selected from the group consisting of hydrogen, halogen, C_{1-4} alkyl and alkoxy, alkalimetal salts of a said acid or addition salts of said acid with a pharmaceutically acceptable base.

4,255,586

BORON-SILICON COMPOUNDS SUITABLE FOR USE AS HYDRAULIC FLUIDS

Colin J. Harrington, Reading, and Herbert F. Askew, Pamber Heath, both of England, assignors to Castrol Limited, Wiltshire, England

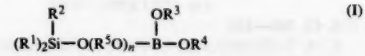
Filed Apr. 13, 1979, Ser. No. 29,856

Claims priority, application United Kingdom, Apr. 14, 1978, 14827/78

Int. Cl.³ C07F *7/02;* C10M *3/44, 3/46*

U.S. Cl. 556—402 **16 Claims**

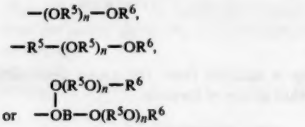
1. A compound of the general formula:



(I)

wherein:

(a) each R^1 is a hydrocarbyl group, or a group of the formula:



(i)

(ii)

(iii)

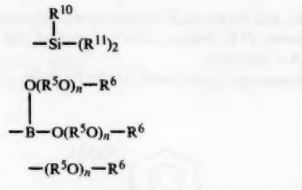
and each R^1 may be the same as, or different from, any other group R^1,

(b) R^2 is an aryl group or a group of the formula (i), (ii), or (iii) as defined above, or a group of the formula:

(iv)

and each group R^2 may be the same as, or different from, any other group R^2,

(c) each of R^3 and R^4 is independently a group of the formula:



(v)

(vi)

(vii)

(d) R^5 is an alkylene or an arylene group and each R^5 may be the same as, or different from, any other group R^5,

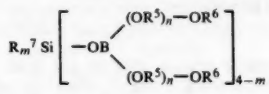
(e) R^6 is a hydrocarbyl group or hydrogen and each group R^6 may be the same as, or different from, any other group R^6,

(f) n is zero or an integer and each n may be the same as, or different from, any other n,

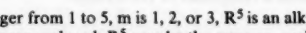
(g) each R^{11} and R^{12} independently is a hydrocarbyl group or a group of the formula (i) or (ii) as defined above, and R^{10} is an aryl group or a group of the formula (i), (ii) or (iv) as defined above,

(h) provided that when R^1 or R^2 is a group of formula (iii), R^3 and R^4 are each not a group of formula (v).

4. A compound of the general formula:



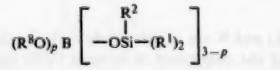
wherein each R^7 independently is a hydrocarbyl group, or a group of the formula:



(i)

n is 0 or an integer from 1 to 5, m is 1, 2, or 3, R^5 is an alkylene or an arylene group and each R^5 may be the same as, or different from, any other group R^5, and R^6 is a hydrocarbyl group or hydrogen and each group R^6 may be the same as, or different from, any other group R^6.

7. A compound of the general formula:



(III)

wherein each R^1 independently is a hydrocarbyl group or a group of the formula:

$$-(OR^5)_n-OR^6 \quad \text{(i)}$$

or

$$-R^5-(OR^5)_n-OR^6 \quad \text{(ii)},$$

each R^2 independently is an aryl group or a group of the formula:

$$-(OR^5)_n-R^6 \quad \text{(i)}$$

$$-R^5-(OR^5)_n-R^6 \quad \text{(ii)}$$

or

$$-O(R^5O)_nSi(R^{12})_3 \quad \text{(iv)}$$

wherein each R^{12} independently is a hydrocarbyl group or a group of the formula (i) or (ii) as defined above, R^8 is a group of the formula

$$-(R^5O)_n-R^6$$

and each group R^8 may be the same as, or different from any other group R^8, p is 0, 1 or 2, and R^5 is an alkylene or an arylene group and each R^5 may be the same as, or different from, any other group R^5, R^6 is a hydrocarbyl group or hydrogen and each group R^6 may be the same as, or different from, any other group R^6 and n is 0 or an integer from 1 to 5.

4,255,587

N-SUBSTITUTED 2,6-DIALKYLANILINES AND PROCESS FOR THEIR PREPARATION

Peter Plath, Ludwigshafen; Wolfgang Rohr, Mannheim, and Norbert Goetz, Worms, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

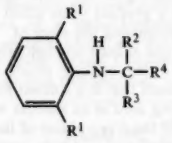
Filed Jan. 10, 1979, Ser. No. 2,328

Claims priority, application Germany, Jan. 19, 1978, 2802211

Int. Cl.³ C07C *101/44*

U.S. Cl. 560—43 **9 Claims**

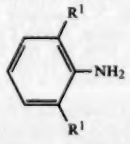
1. A process for the preparation of a N-substituted 2,6-dialkylaniline of the formula



I

where the individual radicals R^1, R^2 and R^3 may be identical or different and each is alkyl of 1 to 7 carbon atoms, R^2 may also be hydrogen, R^4 is

where R^1 has the above meaning, wherein in a first step a 2,6-dialkylaniline of the formula

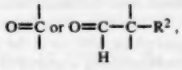


II

where R^1 has the above meaning is reacted at a temperature of from 40° to 200° C. with a carbonyl compound of the formula

III

where R^3 and R^4 have the above meanings and R^7 together with the adjacent carbon atom is



where R^2 has the above meaning, and, after removal of the water formed, in a second step, the resulting Schiff base is hydrogenated with hydrogen in the presence of a hydrogenation catalyst at a temperature of from 0° to 250° C.

4,255,588

SYNTHESIS OF CYCLOHEXENE DICARBOXYLIC ACID ESTERS

Melville E. D. Hillman, Columbus, Ohio, assignor to Gulf Oil Corporation, Pittsburgh, Pa.

Filed Oct. 3, 1979, Ser. No. 81,500

Int. Cl.³ C07C *67/347*

U.S. Cl. 560—127 **3 Claims**

1. A method for the manufacture of a mixture consisting of di-lower alkyl 1,5-cyclohex-1-ene dicarboxylate and di-lower alkyl 1,4-cyclohex-1-ene dicarboxylate which comprises reacting lower alkyl 2-(1-hydroxyethyl) acrylate with an excess of lower alkyl acrylate and with phosphorous pentoxide wherein the lower alkyl acrylate acts as a reactant and a solvent for the reaction in the reaction mixture and separating the desired product mixture therefrom.

4,255,589

PROCESS FOR THE PRODUCTION OF OIL-SOLUBLE POLYOL ESTERS OF DICARBOXYLIC ACID MATERIALS IN THE PRESENCE OF A METAL SALT OF A HYDROXY AROMATIC COMPOUND

Max J. Wisotsky, Highland Park, N.J., assignor to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Jun. 29, 1979, Ser. No. 53,258

Int. Cl.³ C07C *69/593*

U.S. Cl. 560—198 **12 Claims**

1. In a process for the esterification in a hydrocarbon solvent at 120° to 260° C. of a C_6–$C_{10,000}$ hydrocarbon alkenyl substituted succinic anhydride, with a C_2–C_{40} polyol to produce an oil-soluble, ashless dispersant, the improvement which comprises conducting said esterification in the presence of an amount of oil-soluble metal salt of an aromatic hydroxy compound sufficient to reduce the formation of filtration-suppressing insolubles, the metal salt being a normal or basic alkaline earth metal or magnesium metal salt, the aromatic hydroxy compound being phenol or naphthol, alkyl-substituted phenol or naphthol and sulfide and aldehyde derivatives of said phenol, naphthol or alkyl substituted phenol or naphthol.

4,255,590

COMBINATION OF PYROLYSIS AND INCINERATION OF SOLID MIXTURE OF OXYGEN-CONTAINING AROMATIC COMPOUNDS OBTAINED AS RESIDUE OF MANUFACTURE OF BENZENE DI- AND TRICARBOXYLIC ACIDS

John K. Allen, St. Charles, Ill., assignor to Standard Oil Company (Indiana), Chicago, Ill.

Filed Nov. 8, 1979, Ser. No. 92,570
Int. Cl.[3] C07C *51/16*
U.S. Cl. 562—416 3 Claims

1. A method for prevention of bromine-containing particulates from discharge into the atmosphere upon incineration of a solid residue obtained from the manufacture of a benzene di- or tricarboxylic acid by the oxidation of benzene di- or trimethylbenzene in the liquid phase with air in the presence of catalysis provided by a combination of a source of bromine with one or more of cobalt or manganese metal oxidation catalyst; which method comprises (1) subjecting said solid residue in comminuted form or such form suspended in water admixed with an inert particulate solid whose particles are quiescent or in motion as in a fluid bed, expanded bed or a bed made ebullient by passage of inert gas through the bed, to continuous pyrolysis in zone heated to a temperature of at least 700° C. whereat at least a gaseous product is formed which contains at least hydrogen, oxides of carbon, methane, benzene, and toluene and bromine-containing compounds, (2) contacting said gaseous product with a carbonate, hydroxide or oxide of calcium or mixture of calcium and magnesium and then (3) incinerating the gaseous product or the portion thereof after removal of benzene and toluene.

4,255,591

CARBONYLATION PROCESS

Earle C. Makin, Dickinson; Jerry L. Price, Texas City, and Yu W. Wei, Houston, all of Tex., assignors to Monsanto Company, St. Louis, Mo.

Filed Nov. 20, 1978, Ser. No. 962,458
Int. Cl.[3] C07C *51/10, 51/12, 51/14, 67/36, 67/37, 67/38*
U.S. Cl. 562—517 30 Claims

1. In a continuous homogeneous catalytic carbonylation process wherein at least one reactant selected from the group consisting of an olefin, an alcohol, an ester derivative of said alcohol, a halide derivative of said alcohol or an ether derivative of said alcohol is reacted with carbon monoxide in liquid phase in a carbonylation reactor and in the presence of a catalyst system that contains (a) a rhodium or iridium component, and (b) an iodine or bromine component, and wherein a mixed gas stream is removed from the carbonylation reactor, condensable liquids separated therefrom and said gas stream vented, the improvement comprising contacting said vent gas stream with a plurality of organic polymeric hollow fiber membranes potentially degraded by carbonylation products and selectively permeable to hydrogen under conditions substantially non-degrading of said membranes, said conditions comprising said vent gas stream substantially free of carbonylation product and alkyl halide, to generate a non-permeated gas stream of higher carbon monoxide content than said vent gas stream and a permeated stream relatively lower in carbon monoxide content than said vent gas stream, and recycling said non-permeated gas stream of increased carbon monoxide content to said carbonylation reactor.

4,255,592

PROCESS FOR PRODUCING AROMATIC PRIMARY HYDROPEROXIDE

Yoshio Kawai, Niigata; Koichi Kida, Toyosaka; Hideo Ikarashi, Niigata; Tsukasa Toki, Niigata, and Yoshiharu Suzuki, Niigata, all of Japan, assignors to Mitsubishi Gas Chemical Company, Inc., Tokyo, Japan

Filed Sep. 27, 1979, Ser. No. 79,330
Claims priority, application Japan, Oct. 3, 1978, 53-121643
Int. Cl.[3] C07C *179/035*
U.S. Cl. 568—573 11 Claims

1. A process for producing an aromatic primary hydroperoxide selected from the group consisting of benzyl hydroperoxide, o-methylbenzyl hydroperoxide, m-methylbenzyl hydroperoxide, p-methylbenzyl hydroperoxide, 3,5-dimethylbenzyl hydroperoxide, and a mixture of 2,4-, 3,4- and 2,5-dimethylbenzyl hydroperoxide by oxidizing a methyl-substituted aromatic compound selected from the group consisting of toluene, o-xylene, m-xylene, mesitylene and pseudocumene in a liquid phase with a molecular oxygen-containing gas, which comprises carrying out the oxidation at 80° C.–150° C. and under a pressure ranging from atmospheric to 100 kg/cm^2 gage in the presence of 8–300 parts by weight of an aliphatic tertiary hydroperoxide having the formula:

$$\begin{matrix} R_1 \\ R_2—C—O—OH \\ R_3 \end{matrix} \quad \text{or} \quad HO—O—\begin{matrix} R_1 \\ C \\ R_2 \end{matrix}—X—\begin{matrix} R_3 \\ C \\ R_4 \end{matrix}—O—OH$$

wherein R_1, R_2, R_3 and R_4 each represent alkyl groups having 1 to 4 carbon atoms, cycloalkyl groups or cycloalkyl groups having an alkyl group of 1 to 4 carbon atoms as a substituent and X represents alkylene groups having 1 to 4 carbon atoms per 100 parts by weight of the methyl-substituted aromatic compound.

4,255,593

SALTS OF POLYCHLORINATED PHENOLS

Fritz J. Nagel, Memphis, Tenn., assignor to Chapman Chemical Company, Memphis, Tenn.

Filed Feb. 21, 1980, Ser. No. 123,380
Int. Cl.[3] C07C *39/32, 39/34, 39/36*
U.S. Cl. 568—776 17 Claims

1. A method for reacting at least one halogenated phenol with an alkali to form a product of an alkali metal salt of the halogenated phenol comprising the steps of

(a) mixing an alkali and at least one halogenated phenol at a temperature below the melting points of the reactants with a liquid medium that is a solvent for the alkali, said liquid medium being used in an amount which is less than that required to fill the free volume of the solids obtained by reacting said alkali and said halogenated phenol,

(b) conducting the reaction in a closed reaction zone,

(c) removing liquid from the mixture in the system until a dry or almost dry product is obtained,

(d) agitating the mixture during at least a part of the liquid removal step, and

(e) discharging the dry or almost dry product from the closed system.

4,255,594

HYDROGENATION OF HALOGEN-CONTAINING CARBOXYLIC ANHYDRIDES

Miroslav Novotny, Denville, N.J., assignor to Allied Chemical Corporation, Morris Township, Morris County, N.J.

Filed Sep. 18, 1979, Ser. No. 76,658
Int. Cl.[3] C07C *31/38*
U.S. Cl. 568—842 5 Claims

1. A process for hydrogenating 2,2,2-trifluoroacetic anhydride to 2,2,2-trifluoroethanol, comprising contacting said anhydride in the liquid phase at a temperature of about 50°–150° C. and pressure of about 5–15 atmospheres with an

atmosphere consisting essentially of hydrogen gas, and with a rhodium catalyst, of the group consisting of rhodium metal, rhodium oxides, and mixtures thereof, supported on carbon or alumina.

4,255,595

OPTICALLY ACTIVE CYCLOOCTENYL ETHYL ALCOHOL

Günther Wilke; Borislav Bogdanovic, and Horst Pauling, all of Mülheim/Ruhr, Fed. Rep. of Germany, assignors to Studiengesellschaft Kohle mbH, Mülheim/Ruhr, Fed. Rep. of Germany

Division of Ser. No. 947,903, Oct. 2, 1978, which is a division of Ser. No. 836,442, Sep. 22, 1977, Pat. No. 4,152,366, which is a division of Ser. No. 649,164, Jan. 14, 1976, Pat. No. 4,098,834, which is a continuation of Ser. No. 413,722, Nov. 7, 1973, Pat. No. 3,978,147, which is a continuation-in-part of Ser. No. 166,957, Jul. 28, 1971, abandoned. This application Oct. 10, 1979, Ser. No. 83,481

Claims priority, application Fed. Rep. of Germany, Aug. 6, 1970, 2039125

Int. Cl.[3] C07C *35/20*

U.S. Cl. 568—821 1 Claim

1. Optically active cyclooctenyl ethyl alcohol.

4,255,596

PREPARATION OF ETHYLENE GLYCOL FROM ETHYLENE

Ching-Yong Wu, Fox Chapel Borough; Thaddeus P. Kobylinski, Gibsonia, and John E. Bozik, Plum Borough, all of Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 948,243, Oct. 3, 1978, abandoned. This application Feb. 25, 1980, Ser. No. 124,416

Int. Cl.[3] C07C *29/04*

U.S. Cl. 568—860 8 Claims

1. A method of preparing ethylene glycol in a homogeneous, single-phase reaction which comprises contacting ethylbenzene hydroperoxide with an excess of ethylene at a pressure of between about 25 and about 1,500 psig. in a solution comprising between about 2.5 and about 50 weight percent ethylbenzene, between about one and about 20 weight percent ethylbenzene, hydroperoxide and between about 30 and about 98 weight percent of an organic polar solvent in the presence of a sufficient amount of a tetraalkylammonium hydroxide in which the alkyl group has from one to about five carbon atoms to give a pH of about 14 and a catalytic amount of osmium tetroxide at a moderate temperature.

4,255,597

PROCESS FOR PREPARING HEXACHLOROCYCLOPENTADIENE

Kalidas Paul, Bolingbrook, and Glendon D. Kyker, Glen Ellyn, both of Ill., assignors to Velsicol Chemical Corporation, Chicago, Ill.

Continuation-in-part of Ser. No. 77,463, Sep. 20, 1979. This application Apr. 18, 1980, Ser. No. 141,458

Int. Cl.[3] C07C *17/02*

U.S. Cl. 570—220 7 Claims

1. A process for the production of hexachlorocyclopentadiene comprising the steps of:

(a) reacting liquid cyclopentadiene and chlorine at a temperature of from about 0° to about 100° C. until a minimum of 4 chlorine atoms has been added per mole of cyclopentadiene to form a first-stage product;

(b) heating the resultant liquid reaction product of step (a) in a second stage at a temperature of from about 140° C. to below about 200° C. with chlorine in the presence of from about 0.001% to about 5.0% (by weight) of an aromatic compound until the reaction products of step (a) contain an average of about 6 chlorine atoms per molecule, based on cyclopentadiene starting material; wherein said aromatic compound is selected from the group consisting of phenanthroline and 8-hydroxy-quinoline

(c) vaporizing and heating the resulting reaction products of step (b) in a third stage in the presence of chlorine to a temperature of above 450° C. until at least a major portion of said products are converted to hexachlorocyclopentadiene; and

(d) recovering therefrom hexachlorocyclopentadiene.

4,255,598

SUPPRESSION OF ALDEHYDE FORMATION IN XYLENE

Ronald Elsdon, St. Charles, and Dennis L. Stauffenberg, Mahattan, both of Ill., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Filed Dec. 26, 1979, Ser. No. 106,698

Int. Cl.[3] B01D *3/34*

U.S. Cl. 585—3 4 Claims

1. A method of suppressing tolualdehyde formation in a xylene contacted with air which comprises dissolving in the xylene thiodipropionic acid or a di(C_1 to C_{20} alkyl) ester thereof in an amount of upward from 100 ppm of the free acid or a chemically equivalent amount of the diester.

4,255,599

PREPARATION OF STYRENE FROM ETHYLBENZENE

Ching-Yong Wu, Fox Chapel Borough; Thaddeus P. Kobylinski, Gibsonia, and John E. Bozik, Plum Borough, all of Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa.

Filed Mar. 12, 1980, Ser. No. 129,582

Int. Cl.[3] C07C *5/333*

U.S. Cl. 585—319 13 Claims

1. A method of converting ethylbenzene to styrene at high selectivity which comprises the steps

a. contacting ethylbenzene at an elevated temperature under substantially anhydrous conditions with molecular oxygen whereby an oxidized solution containing ethylbenzene hydroperoxide, 1-phenylethanol and acetophenone in ethylbenzene is obtained,

b. contacting said oxidized solution with ethylene or propylene at an elevated pressure in an organic polar solvent and in the presence of a tetraalkylammonium hydroxide and osmium tetroxide at a moderate temperature whereby 1-phenylethanol and acetophenone are produced, and

c. separating out a mixture of the 1-phenylethanol and acetophenone obtained in steps a and b from the reaction mixture and hydrogenating the acetophenone to 1-phenylethanol and dehydrating the 1-phenylethanol to styrene.

4,255,600

ZSM-12 CYCLOOLEFIN DIMERIZATION

L. Brewster Young, Skillman, N.J., assignor to Mobil Oil Corporation, Fairfax, Va.

Filed Dec. 5, 1979, Ser. No. 100,592

Int. Cl.[3] C07C *175/10, 2/76*

U.S. Cl. 585—362 11 Claims

1. A process for the selective dimerization of cycloolefins having from 5 to about 12 carbon atoms which comprises contacting said olefins in the liquid phase with ZSM-12 at temperatures from about 75° C. to about 400° C.

4,255,601

PROCESS FOR MAKING INDENE

Philip L. Kuch, Aurora, and Daniel R. Herrington, Warrensville, both of Ohio, assignors to The Standard Oil Company, Cleveland, Ohio

Filed Sep. 24, 1979, Ser. No. 78,121

Int. Cl.[3] C07C *2/66, 2/84, 13/465*

U.S. Cl. 585—411 13 Claims

1. A process for producing indene comprising contacting

benzene and propylene together in a liquid medium containing a transition metal complex of a metal selected from the group consisting of Au, Ag, Rh, Ir, Hg, Ni, Cu, Ru, Pt, Pd and Os.

4,255,602

STILBENE FORMATION BY MEANS OF TOLUENE DEHYDROCOUPLING USING A COBALT-LANTHANIDE CATALYST

Samuel J. Tremont, Manchester, Mo., and Alex N. Williamson, Greensboro, N.C., assignors to Monsanto Company, St. Louis, Mo.

Filed Dec. 10, 1979, Ser. No. 101,922
Int. Cl.³ C07C 2/72
U.S. Cl. 585—428 **15 Claims**

1. A process for dehydrocoupling toluene which comprises contacting the toluene in the vapor phase at a temperature between about 450° C. and about 650° C. with an inorganic metal/oxygen composition represented by the empirical formula:

$$M_a^1M_b^2O_x$$

where M^1 is cobalt and M^2 is lanthanum, and wherein a is 1, b is 1 to 10, and x is a number taken to satisfy the average valences of M^1 and M^2 in the oxidation states in which they exist in the composition to yield the dehydrocoupled toluene product.

4,255,603

DEHYDROCOUPLING OF TOLUENE

Alex N. Williamson, Greensboro, N.C., and Samuel J. Tremont, Manchester, Mo., assignors to Monsanto Company, St. Louis, Mo.

Filed Dec. 10, 1979, Ser. No. 101,929
Int. Cl.³ C07C 2/72
U.S. Cl. 585—428 **16 Claims**

1. A process for dehydrocoupling toluene which comprises contacting the toluene in the vapor phase at a temperature between about 450° C. and about 650° C. with an inorganic metal/oxygen composition represented by the empirical formula:

$$M_a^1M_b^2O_x$$

where M^1 is thorium and M^2 is an element selected from copper and Group 2b of the Periodic Table of the Elements, and wherein a is 1, b is 0.01 to 10, and x is a number taken to satisfy the average valences of M^1 and M^2 in the oxidation states in which they exist in the composition to yield the dehydrocoupled toluene product.

4,255,604

DEHYDROCOUPLING OF TOLUENE

Alex N. Williamson, Greensboro, N.C.; Samuel J. Tremont, Manchester, and Arthur J. Solodar, University City, both of Mo., assignors to Monsanto Company, St. Louis, Mo.

Filed Dec. 10, 1979, Ser. No. 101,941
Int. Cl.³ C07C 2/72
U.S. Cl. 585—428 **17 Claims**

1. A process for dehydrocoupling toluene which comprises contacting the toluene in the vapor phase at a temperature between about 450° C. and about 650° C. with an inorganic metal/oxygen composition represented by the empirical formula:

$$M_a^1M_b^2O_x$$

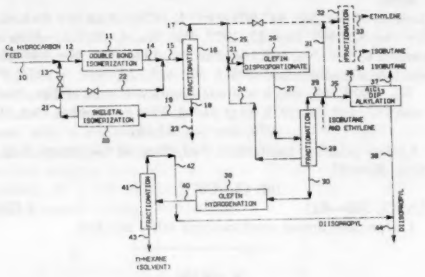
where M^1 is lead and M^2 is at least one element selected from silver, zinc, phosphorus, arsenic, thorium, the lanthanides, Groups 1*a*, 3*b*, 4*b*, and 8 of the Periodic Table of the Elements, and mixtures thereof, and wherein a is 1, b is 0.01 to 10, and x is a number taken to satisfy the average valeneces of M^1 and M^2 in the oxidation states in which they exist in the composition to yield the dehydrocoupled toluene product.

4,255,605

DIISOPROPYL FROM BUTENES

Rolland E. Dixon, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jan. 2, 1980, Ser. No. 108,995
Int. Cl.³ C07C 2/58
U.S. Cl. 585—332 **13 Claims**



1. A process of preparation of high octane diisopropyl (2,3-dimethylbutane) from a mixed butenes feed stream comprising butene-1, butenes-2, isobutane, n-butane and isobutylene (isobutene) wherein said process comprises the steps

(a) subjecting said mixed butenes stream to double bond isomerization to convert butene-1 to butenes-2;

(b) fractionating the effluent from step (a) into an overhead comprising isobutane, isobutene and butene-1 and a bottoms stream comprising n-butane and butenes-2;

(c) subjecting at least a portion of said bottoms stream in (b) to skeletal isomerization to convert butenes-2 to isobutylene;

(d) combining the effluent from (c) with the effluent from (a) and fractionating the combined streams in (b);

(e) disproportionating the overhead in step (b) to convert isobutylene to ethylene and 2,3-dimethylbutene-2 and butenes-2 to ethylene and normal hexene and heavier olefinic hydrocarbons;

(f) fractionating the effluent from (e) into an overhead comprising C_2 and isobutane, a side stream comprising butylenes, and a bottoms stream comprising six carbon hydrocarbons including 2,3-diemthylbutene-2 and n-hexane and heavies;

(g) recycling said sidestream separated in (f) to step (e) for disproportionation;

(h) hydrogenating said bottoms stream separated in (f) to produce n-hexane and 2,3-dimethylbutane (DIP), and

(i) a separating 2,3-dimethylbutane as product.

4,255,606

IMPROVED PARA- AND ORTHO-XYLENE ISOMERIZATION BY ADDING PENTANE

Harold F. Tse, Kearny, N.J., assignor to Engelhard Minerals & Chemicals Corporation, Iselin, N.J.

Filed Nov. 28, 1979, Ser. No. 98,099
Int. Cl.³ C07F 5/22
U.S. Cl. 585—482 **14 Claims**

1. In a process for the isomerization of aromatic hydrocarbons containing eight carbon atoms per molecule to produce para-xylene and ortho-xylene wherein said aromatic hydrocarbons are contacted in an isomerization zone with an isomerization catalyst at elevated temperature and pressure suitable for such isomerization in the presence of added hydrogen and the contacted material withdrawn from said zone, the improvement which comprises introducing into said isomerization zone

from about 1 to 10 weight percent of the total feed to the isomerization zone, of at least one aliphatic hydrocarbon containing at least 5 carbon atoms per molecule.

4,255,607

SEPARATION OF C_8 AROMATIC ISOMERS

Tetsuya Miyake; Kohji Inada, and Motohisa Asano, all of Kawasaki, Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Japan

Filed Aug. 24, 1979, Ser. No. 69,420

Claims priority, application Japan, Sep. 7, 1978, 53-109118; Sep. 7, 1978, 53-109119

Int. Cl.³ C07C *7/13*

U.S. Cl. 585—805 **22 Claims**

1. A process for the adsorption separation of C_8 aromatic isomers which comprises the steps of:

(a) Supplying a C_8 aromatic isomer mixture to a separation zone packed with a zeolite adsorbent to form an C_8 aromatic isomer mixture adsorption band, the zeolite being a faujasite structured zeolite where at least about 60% of the exchangeable cation sites are replaced by potassium ion, and the remaining exchangeable cation sites being replaced by at least one metal cation selected from the group consisting of sodium, lithium, rubidium, cesium, magnesium, calcium, strontium, barium, nickel, copper, silver, manganese, cadmium, thallium and lanthanum ions;

(b) Supplying a desorbent to the separation zone to develop the C_8 aromatic isomer mixture adsorption band, the desorbent being an ether compound having a substantially constant selectivity, within the range of about 0.3 to about 3.0, over para-xylene measured at a concentration of about 10 to about 90% by weight of the ether compound in the mixture of the ether compound and para-xylene;

(c) Repeating the step (a) and the step (b) alternately to effect the migration of the C_8 isomer mixture adsorption band; and

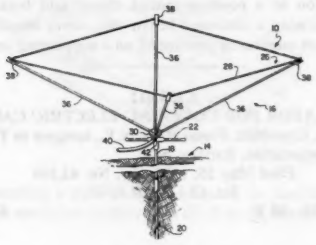
(d) Collecting the entire amount of the C_8 aromatic isomer in fractions at the outlet of the separation zone.

4,255,608

TEMPORARY ELECTRICAL GROUNDING ROD BARRICADE APPARATUS

Mahlon L. Bosch, and Jason S. Kehl, both of Centralia, Mo., assignors to A. B. Chance Company, Centralia, Mo.

Filed Nov. 9, 1979, Ser. No. 92,996
Int. Cl.³ H01R *4/66*
U.S. Cl. 174—5 R **8 Claims**



1. A protective device, comprising:

an elongated electrical grounding rod for insertion into the earth; and

structure for preventing a person from coming into close proximity with said grounding rod when the latter is installed in the earth, including

electrically insulative perimeter-defining means located in a position circumscribing said rod and in a laterally spaced, elevated relationship to said rod; and

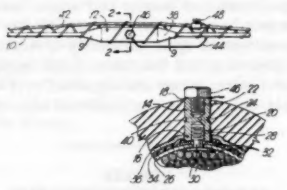
means supporting said perimeter-defining means in said position, said support means including a plurality of support struts operatively connected to said perimeter-defining means and extending from the latter to a point closely adjacent said rod.

4,255,609

TELECOMMUNICATIONS CABLE WITH GROUNDING INSTALLATIONS AT SPACED INTERVALS AND METHOD OF MAKING SAME

Leonard J. Charlebois, Kanata, and James K. Kho, Nepean, both of Canada, assignors to Northern Telecom Limited, Montreal, Canada

Filed Dec. 18, 1979, Ser. No. 104,884
Int. Cl.³ H02G *7/10*; H01B *7/18*; H01R *4/66*
U.S. Cl. 174—41 **10 Claims**



1. A telecommunications cable with an electrically conductive shield surrounding a cable core, and grounding installations at spaced intervals along the cable, each grounding installation comprising:

(a) an electrically conductive shield clamp comprising opposing jaws, one on the inside and the other on the outside of the shield;

(b) an electrically conductive adaptor extending outwardly of the cable from the jaws and having an inner end and an outer end each formed with a screw thread;

(c) a screw threaded clamp stud in screw threaded and electrically conductive engagement with the inner end of the adaptor to hold the jaws securely clamped to the shield and electrically connected to the adaptor;

(d) an electrically insulating encapsulation which encapsulates the adaptor and the cable axially on each side of the adaptor with the outer end of the adaptor accessible from the outside of the encapsulation for connecting a grounding extension to the adaptor; and

(e) the adaptor of each installation having retaining means to hold it securely and against rotation in the encapsulation and the encapsulations of the installations being spaced-apart along the cable at the installation positions.

7. A method of providing grounding installation at spaced intervals along a telecommunications cable having an electrically conductive shield surrounding the cable core, the method comprising:

providing an electrically conductive adaptor which has an inner end and an outer end each formed with a screw thread and a retaining means to hold it securely against rotation in an electrically insulating encapsulation to be applied as part of the installation;

disposing opposing jaws of an electrically conductive shield clamp one on the inside and the other on the outside of the shield;

locating the adaptor to extend outwardly of the cable from the jaws and securing a screw threaded clamp stud in screw threaded and electrically conductive engagement with the inner end of the adaptor to hold the jaws securely clamped to the shield and electrically connected to the adaptor; and

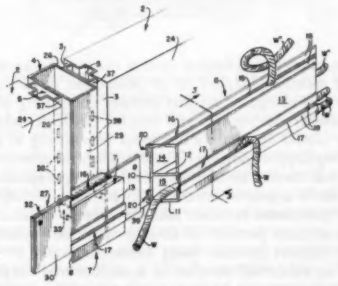
encapsulating the adaptor and the cable axially on each side of the adaptor in the encapsulation while rendering the outer end of the adaptor accessible from the outside of the encapsulation for connecting a grounding extension to the adaptor, the retaining means of the adaptor serving to hold it securely and against rotation in the encapsulation, and the encapsulations of the installations being spaced-apart along the cable.

4,255,610

PARTITION WIRING SYSTEM

Melvin A. Textoris, Struthers, Ohio, assignor to GF Business Equipment, Inc., Youngstown, Ohio

Filed May 3, 1978, Ser. No. 902,335
Int. Cl.³ H02G *3/26*
U.S. Cl. 174—48 **13 Claims**



1. A wiring system for a partition assembly including a plurality of longitudinally aligned panels provided with opposite faces and having end edges attached to adjacent intermediate supporting posts provided with opposite faces, said wiring system including, an integral hanger assembly removably attachable to said partition assembly adjacent each said post and overlying at least one said post face, at least a pair of adjacent ones of said hanger assemblies having a medial spanner section each overlying one said post face and joined to a pair of co-planar end sections respectively overlying the adjacent said panel faces, a pair of elongated panel wiring channels each having an

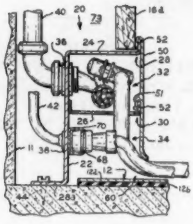
interior longitudinal wiring compartment bounded by an inner wall overlying said adjacent panel faces and having end edges each overlying and engaging one of said end sections of said pair of adjacent hanger assemblies, said panel wiring channel end edges disposed adjacent the juncture between the respective said post and panel end edges, an elongated post wiring channel having an interior longitudinal wiring compartment bounded by an inner wall overlying and engaging each said hanger assembly medial spanner section intermediate said end sections, said post wiring channel having terminal end edges juxtaposed and defining a close axially aligned mating fit with said end edges of said two adjacent panel wiring channels, mounting means on said panel and post wiring channels adjacent said inner walls and engageable with said hanger assembly end sections and medial sections respectively, said panel and post wiring channels of similar vertical cross-sectional configuration whereby, said respective wiring compartments are horizontally aligned, a vertically slotted member adjacent the juncture of each said post and two adjacent panels, and said pair of adjacent ones of said hanger assemblies including hook means disposed intermediate said spanner section and two end sections and engageable with said slotted members to fixedly retain said hanger assemblies with each said integral hanger assembly engaged by and supporting one said post wiring channel and at least one said panel wiring channel.

4,255,611

ENERGY DISTRIBUTION SYSTEM FOR ENCLOSED AREAS

Robert L. Propst, Ann Arbor, and Michael A. Wodka, Ypsilanti, both of Mich., assignors to Herman Miller, Inc., Zeeland, Mich.

Filed Oct. 20, 1978, Ser. No. 953,096
Int. Cl.³ H02G *3/28*
U.S. Cl. 174—48 **6 Claims**



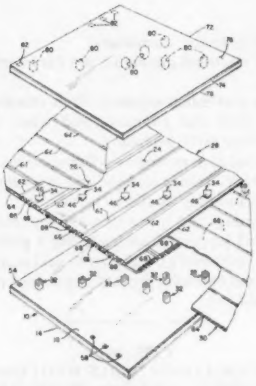
1. An energy distribution system comprising an elongated support member adapted to be positioned on a supporting surface, said elongated support member comprising an upright wall member having top and bottom portions, said bottom portion of said upright wall member terminating at a bottom edge a top support portion on said support member connected at one end thereof to said wall member and extending away therefrom in a general horizontal direction, a bottom support portion positioned between said top support portion and the bottom support portion of said upright wall member, said bottom support portion being connected only at one end thereof to said wall member in a cantilevered arrangement, said bottom support portion extending away from said upright wall member in said general horizontal direction so as to form a pair of utility spaces, one of said utility spaces being provided between said support portions and the other utility space being provided below said bottom support portion, means for maintaining said wall member in an upright position on said supporting surface, passageway means formed through said bottom support portion enabling communication between said utility spaces whereby elements that are positionable in one of said utility spaces can be extended through said passageway means into the other of said utility spaces, the ends of said support portions projecting outward from said wall member being vertically spaced apart to define an access opening communicating with one of said utility spaces, an upright flange extension on said top support portion, an upright flange extension on said bottom support portion, and a cover member with a pair of vertically spaced apart inverted hook portions, said hook portions engaging said flange extensions so that said cover member is removably mounted by hanging on said support portions and thereby covers said access opening to one utility space and extends downwardly below said bottom support portion to a position spaced above said bottom edge thereby forming a clearance below said cover member when said support member is positioned on a supporting surface.

4,255,612

INSULATOR FOR COVERING ELECTRIC CABLES

Michael A. Grundfest, Forest Hills, N.Y., assignor to Thomas & Betts Corporation, Raritan, N.J.

Filed May 25, 1979, Ser. No. 42,538
Int. Cl.³ H01R *9/07*
U.S. Cl. 174—88 R **40 Claims**



1. An insulator for insulating the juncture between two or more electric conductors where the connector used to join such conductors extends above the surface of the surrounding joined electric conductors a first predetermined height comprising: a plurality of spacer means each having second predetermined heights above the surrounding joined electric conductors, said second predetermined heights being greater than said first predetermined height, said spacer means at least partially surrounding the connector used to join the electric conductors and spaced apart sufficiently to receive such connector therebetween; and insulation means engaging a first surface of said spacer means and supported over said connector when said spacer means are positioned adjacent a connector.

4,255,613

ELECTRICAL INTERCONNECT

Richard D. Ketchpel, Santa Barbara, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Jun. 15, 1979, Ser. No. 48,942
Int. Cl.³ H01R *9/07, 9/09*
U.S. Cl. 174—88 R **17 Claims**

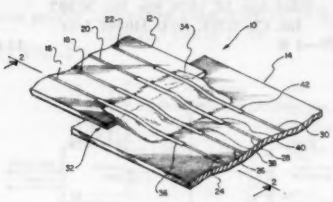
1. A method of connecting a first component, including a first electrical conductor disposed thereon, and a second component, including a second electrical conductor disposed thereon, comprising the steps of:

(a) positioning the first component proximate to the second component to establish a juncture area;

(b) aligning the first conductor with the second conductor in the juncture area;

(c) adhesively joining the first component to the second component;

(d) covering the juncture area with an insulating layer to form a smooth surface transition between the first and second components; and



(e) depositing a third conductor across the insulating layer and in electrical contact with the first and second conductors.

4,255,614

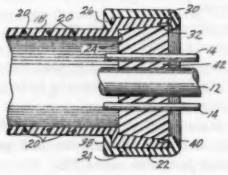
METHOD AND APPARATUS FOR ENCLOSING A CABLE SPLICE

William H. Channell, 122 Oak Tree Dr., Glendora, Calif. 91740

Continuation-in-part of Ser. No. 898,304, Apr. 20, 1978, abandoned. This application Mar. 22, 1979, Ser. No. 22,832

Int. Cl.³ H02G *15/18*

U.S. Cl. 174—93 **10 Claims**



1. A flexible cable splice enclosure comprising a tubular housing of soft resilient flexible material having integrally formed tubular end portions at either end, the tubular housing freely bending in an arc along its longitudinal axis, each end portion having a resilient tapered interior wall, means providing a continuous rigid non-expandable band surrounding said tapered wall to limit outward expansion of the resilient flexible material forming said tapered wall, a tapered plug of resilient flexible material surrounding the cable inserted into each end portion of the tubular housing, and means forming a lip projecting radially inwardly of the tapered surface at the outer margins of the tapered walls for retaining the plugs in the end portions of the housing.

4,255,615

DIELECTRIC CORONA RINGS

Kwang T. Huang, Port Hueneme, and Brian R. Milner, Camarillo, both of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Sep. 24, 1979, Ser. No. 78,257

Int. Cl.³ H01B *17/44*

U.S. Cl. 174—140 CR **3 Claims**

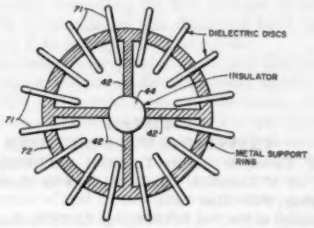
1. A corona ring in combination with a high voltage insulator, comprising:

a. a high voltage insulator means;

b. a metallic support means mounted about said high voltage insulator means;

c. a corona ring formed from a metallic toroid mounted on said support means for surrounding said high voltage insulator means;

d. said toroid having a plurality of spaced apart dielectric discs of substantially greater diameter than the thickness of said toroid mounted thereon about the circumference thereof; the electric field about the corona ring being operable to be vared by varying the number of and the



spacing between said dielectric discs, the electric field tending to move toward said toroid ring when the spacing between said dielectric discs is increased;

e. said corona ring and dielectric discs operating to spread and deconcentrate an electric field in and near the corona ring about said high voltage insulator and reduce the likelihood of corona and flash discharging.

4,255,616

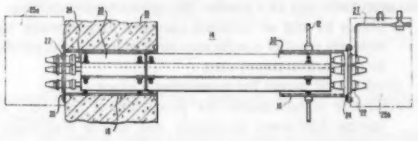
CABLE SUPPORT ASSEMBLY FOR ELECTRICAL PENETRATION ASSEMBLY FOR REACTOR CONTAINMENT

Vito A. Liotino, Horseheads, N.Y., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jan. 18, 1979, Ser. No. 4,515

Int. Cl.² G21C *13/04;* **H01B** *17/26*

U.S. Cl. 174—151 **8 Claims**



1. In an electrical penetration assembly for a nuclear reactor containment, which containment includes a first containment wall with a first cylindrical nozzle therethrough, an annularly spaced apart second containment wall constituting a shield wall having a second cylindrical nozzle therethrough, with the first and second nozzles being axially aligned, with a cable support assembly for mounting and shielding electrical cables which sealingly pass through the axially aligned nozzles, the improvement being cable support assembly comprising:

(a) at least two spaced apart axially aligned central support means with a plurality of radially extending support arms extending outwardly from each of the central support means;

(b) a plurality of tubular cable conduit members extending between the spaced apart axially aligned central support means, with individual tubular cable conduit members nested between and supported from adjacent radially extending support arms;

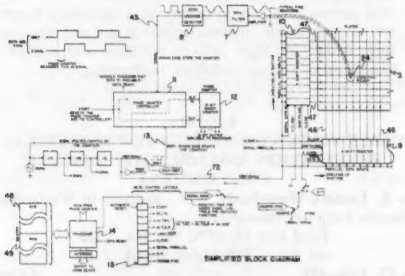
(c) one of the central support means being disposed within a nozzle portion of the penetration assembly, and anchor mounting means provided at the extending ends of at least a portion of the support arms which extend radially therefrom to fixedly anchor one end of the cable support assembly within the nozzle portion, and the other central sup-

port means also being disposed within a nozzle portion of the penetration assembly and having movable mounting means provided at the extending ends of the support arms which extend radially therefrom to permit sliding movement of the other end of the cable support assembly within that nozzle portion.

4,255,617
TRAVELLING WAVE DIGITIZER

Frank P. Carau, Sr.; Henry T. Hetzel, and Michael A. Tremblay, all of Loveland, Colo., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Continuation of Ser. No. 944,931, Sep. 22, 1978, abandoned. This application Aug. 27, 1979, Ser. No. 69,956
Int. Cl.[3] G08C *21/00*
U.S. Cl. 178—19 **54 Claims**



1. Apparatus for digitizing the coordinate of a point along a measurement axis of a platen, the apparatus comprising:

a platen having an ordered plurality of uniformly spaced separate parallel conductors each generally perpendicular to the measurement axis;

clock signal means for generating a clock signal;

reference signal means for producing a reference signal having half-wave symmetry and whose frequency is a submultiple of that of the clock signal;

propagation circuit means coupled to receive both the clock signal and the reference signal and having an ordered plurality of outputs coupled in one-to-one correspondence to the separate parallel conductors of the platen for propagating across the platen at a rate of one conductor per cycle of the clock signal a half-wave symmetric electric field having transitions in intensity corresponding to the half-wave symmetry of the reference signal;

a capacitive pickup positionable over the point whose coordinate is to be digitized, capacitively coupled thereat to the parallel conductors in the platen and providing a half-wave symmetric pickup signal of frequency equal to that of the reference signal as the half-wave symmetric electric field propagates across the platen and past the capacitive pickup;

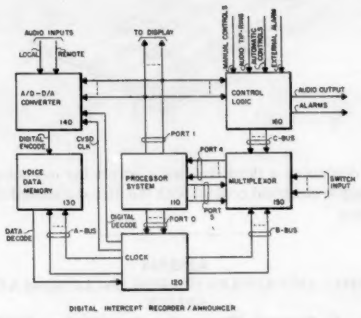
a filter tuned to reject harmonics of the reference signal and having an input coupled to the capacitive pickup for providing a filtered pickup signal at an output of the filter; and

phase comparison means coupled to the output of the filter and to the reference signal means, for producing data corresponding to the phase difference between the filtered pickup signal and the reference signal.

4,255,618
DIGITAL INTERCEPT RECORDER/ANNOUNCER SYSTEM

Dean W. Danner, and Gary J. Kiel, both of Waukesha, Wis., assignors to GTE Automatic Electric Laboratories, Incorporated, Northlake, Ill.

Filed Apr. 18, 1979, Ser. No. 30,987
Int. Cl.[3] G10L *1/00*; H04M *1/64*
U.S. Cl. 179—1 B **12 Claims**



1. A digital recorder/announcer system for use in conjunction with a telephone central office, said central office providing an audio input to said recorder/announcer system and said system providing an audio output suitable for connection to a telephone subscriber's line, said digital recorder/announcer system comprising:

a clock providing for periodic pulses;

a microprocessor CPU connected to said clock;

a program memory connected to said microprocessor CPU;

a memory interface unit connected between said CPU and said program memory;

multiplexor means connected to said CPU, said multiplexor means operated in response to said periodic pulses to transmit said pulses to said CPU;

converter means including a continuously variable slope delta modulator connected to said audio input and including circuit connections to said clock, said converter means operated in response to said audio signals received at said audio and in response to said CPU vai said clock to generate digital output signals;

read/write memory means connected to said converter means and including circuit connections to and from said clock, said read/write memory means for storing said digital output signals, operated in response to each of said digital output signals and operated in response to said CPU via said clock to store a binary representation of said digital output signal;

said clock operated in response to said CPU to selectively control the storage of said binary representations in said read/write memory one at a time and said clock alternatively operated in response to said CPU to selectively and sequentially control the retrievel of said binary representations for transmission to said converter means one at a time, so that said stored binary representations are read out from said read/write memory in the same order that said signals were stored in said read/write memory;

said read/write memory means alternatively operated in response to said clock and to said stored binary representation, to read out and to transmit said binary representations to said converter means; and

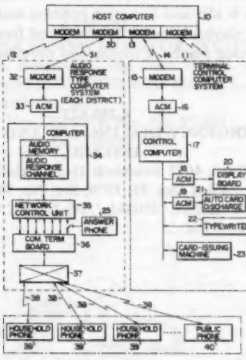
said converter means alternatively operated in response to said clock and to said binary representations read out of said read/write memory means to convert said binary representations to analog signals and couple said analog signals to said subscriber's line via said audio output.

4,255,619

TELEPHONE RESERVATION-PROCESSING SYSTEM

Hideo Saito, Koganei, Japan, assignor to Keihin Electric Express Railway Co., Ltd. and Tokyo Shibaura Denki Kabushiki Kaisha, both of, Japan

Filed Sep. 5, 1979, Ser. No. 72,684
Claims priority, application Japan, Oct. 14, 1978, 53-125708
Int. Cl.[3] H04M *11/00*
U.S. Cl. 179—2 A 6 Claims



1. A telephone reservation-processing system which comprises a host computer;

a plurality of audio response type computers connected to the host computer through a telephone line;

at least one terminal unit-controlling computer connected to the host computer through a telephone line; and

a large number of telephones connected to the plural audio response type computers through a telephone line,

and wherein the host computer includes means for processing data relative to requests for reservations, inquiries and cancellations transmitted from the telephone through the audio response type computer, and means for processing data relative to requests for transmission of data delivered from the terminal unit-controlling computer; each of the plural audio response type computers includes a semiconductor audio memory for storing an audio pattern, an audio channel for accessing the audio memory, means for actuating the audio channel in accordance with the result of a response made by the host computer, and means for converting the result of a response made by the host computer into an audio signal and transmitting said audio signal to the telephone when the audio channel accesses the audio memory; and the terminal unit-controlling computer includes means for supplying the host computer with a signal requesting reservation, inquiry or cancellation delivered from the terminal unit and transmitting data sent forth from the host computer to the terminal unit.

4,255,620

METHOD AND APPARATUS FOR BANDWIDTH REDUCTION

Richard W. Harris, Lodi; John F. Cleveland, Stockton, and Thomas M. Lott, San Mateo, all of Calif., assignors to VBC, Inc., San Mateo, Calif.

Filed Jan. 9, 1978, Ser. No. 868,004
Int. Cl.[3] H04B *1/66*
U.S. Cl. 179—15.55 R 42 Claims

20. A communications system for transmitting information-bearing input signals from a first location to a second location via a communication link having a predetermined system frequency bandwidth, said input signals having first portions lying predominantly within a first fractional portion of said system frequency bandwidth and second portions lying predominantly within a second fractional portion of said system frequency bandwidth, said first and second fractional portions having a different band edge frequency f_u, f_l, respectively, associated therewith, said first and second signal portions being substantially temporally spaced and said second fractional bandwidth portion lying outside said first fractional bandwidth portion, said system comprising:

sending station means including:

input terminal means adapted to receive said input signals;

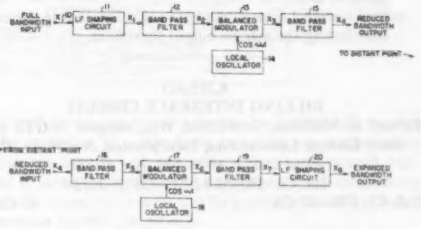
first filter means coupled to said input terminal means for selectively attenuating the first portions of said input signals lying adjacent the associated band edge frequency f_u to produce modified signals;

first processing means coupled to said first filter means for generating first intermediate composite signals comprising first and second frequency translated compound portions, said first compound portion corresponding to said modified signals frequency translated toward said first band edge frequency f_u by a predetermined amount f_O, the second compound portions corresponding to an inversion of said modified signals frequency translated toward said second band edge frequency f_l by a predetermined amount $f_u - f_O$ and folded back from said second band edge frequency f_l into said system frequency bandwidth;

second filter means coupled to said first processing means for selectively filtering said first intermediate composite signals to substantially eliminate said first frequency translated compound portion;

transmitting means; and

means for continuously coupling those signals appearing at the output of said second filter means to said transmitting means;



communication link means coupled to said transmitting means; and

receiving station means coupled to said communication link means for receiving the signals transmitted by said transmitting means, said receiving station means including:

third filter means for selectively filtering the received signals to sharply attenuate any signal portion having a frequency no less than f_O;

second processing means coupled to said third filter means for processing the signals from said third filter means to produce second intermediate composite signals comprising an uninverted portion corresponding to said signals from said third filter means and an inverted portion corresponding to a frequency inversion of said signals from said third filter means about f_O;

fourth filter means coupled to said second processing means for selectively attenuating those portions of said second intermediate composite signals lying adjacent said first band edge frequency f_u; and

output terminal means coupled to said fourth filter means for manifesting the signals output therefrom.

21. The combination of claim 20 wherein said first processing means includes means for generating a carrier signal having a frequency f_O, and means for modulating said modified signals with said carrier signal.

31. A signal processing apparatus for expanding compressed information signals derived from original input signals at a sending station and received over a communication link having

a preselected system frequency bandwidth, said original input signals having first portions lying predominantly within a first fractional portion of said system frequency bandwidth and second portions lying predominantly within a second fractional portion of said system frequency bandwidth, said first and second fractional bandwidth portions each having a different band edge frequency associated therewith, said first and second signal portions being substantially temporally spaced and said second fractional bandwidth portion lying outside said first fractional bandwidth portion, said compressed information signals having frequency spectrum components lying predominantly within the second fractional portion of said system frequency bandwidth and containing equivalent information to that contained in said first and second portions of said original input signals, said apparatus comprising:

first filter means for selectively filtering said compressed signals to sharply attenuate any signal portions lying in the range between the center frequency of said system frequency bandwidth and one of said different band edge frequencies;

processing means coupled to said first filter means for generating intermediate composite signals comprising a direct portion corresponding to said signals from said first filter means and an inverted portion corresponding to a frequency inversion of said signals from said first filter means about substantially said center frequency;

second filter means coupled to said processing means for selectively attenuating those portions of said intermediate composite signals lying adjacent said band edge frequency associated with said first fractional bandwidth portion;

means coupled to said second filter means for amplifying those portions of said intermediate composite signals lying predominantly within said second fractional bandwidth portion; and

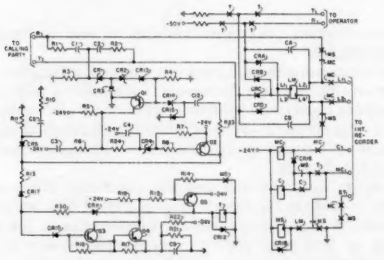
output terminal means coupled to said amplifying means for manifesting the signals output therefrom.

4,255,621

BILLING INTERFACE CIRCUIT

Edward A. Marheine, Brookfield, Wis., assignor to GTE Automatic Electric Laboratories, Incorporated, Northlake, Ill.

Filed Oct. 3, 1979, Ser. No. 81,581
Int. Cl.³ H04M *11/00, 15/10, 15/34*
U.S. Cl. 179—27 CA **10 Claims**



1. A billing interface circuit for use in a private branch exchange including a plurality of stations, said exchange connected to a telephone central office via first and second leads including a trunk, said central office including voice playback means operated to provide a recorded message requesting billing information from an operator located at said telephone central office, said billing interface circuit comprising:

ring detection means connected to a station of said plurality and operated in response to a ringing signal of said station to produce a first signal representative of said ringing signal detection;

latching means connected to said ring detection means and operated in response to said first signal to produce a steady state output signal;

first switching means connected to said latching means and operated in response to said steady state output signal to connect said voice playback means to said first and said second leads for transmission of said recorded message to said operator; and

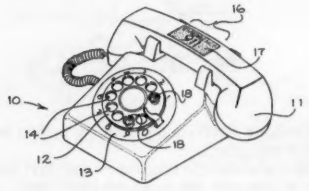
second switching means connected between said latching means and said voice playback means and operated in response to said steady state output signal to control the operation of said tape playback means, whereby said voice playback means is operated when said voice playback means is idle and in a start position and alternatively said voice playback means is prohibited from operation when said voice playback means was previously operated.

4,255,622

EMERGENCY DIALING AID AND MARKING ASSEMBLY

Robert E. Reed, 4623 Reinhardt Dr., Oakland, Calif. 94619

Filed Oct. 31, 1979, Ser. No. 89,920
Int. Cl.³ H04M *1/26;* **B42F** *21/08*
U.S. Cl. 179—90 A **1 Claim**



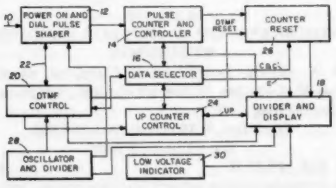
1. In a telephone of a type having a hand piece and dial means associated with a sequence of ten digits progressing from "1" to "0", an aid for dialing a preselected telephone number in the dark comprising a continuously luminous label adhered to the telephone and displaying a preselected telephone number in the dark, a plurality of continuously luminous discrete marker elements disposed proximate associated ones of only those digits of said preselected number for identifying same free of additional illumination.

4,255,623

APPARATUS FOR PULSE TRAIN MEASUREMENT

Larry A. Barnes; Daniel Daugherty; Michael D. Flynn; Michael D. Robertson, and Kenneth R. Welch, all of San Angelo, Tex., assignors to San Angelo Communications & Electronics, Inc., San Angelo, Tex.

Filed Jun. 15, 1979, Ser. No. 48,779
Int. Cl.³ H04M *3/08*
U.S. Cl. 179—175.2 A **23 Claims**



1. Apparatus for measuring the percent interpulse interval and the pulse repetition rate of a pulse train, comprising:

means connected to receive the pulse train for storing a representative count of the number of pulses in the pulse train and for generating control signals,

a data controller responsive to the control signals for gener-

ating numerator and denominator signals of a divide function, and

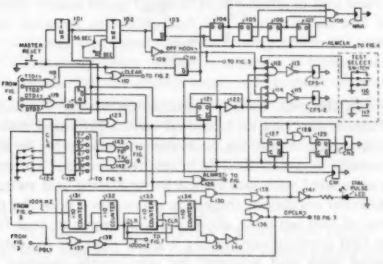
divider means connected to receive the numerator and denominator signals for generating a percent interpulse interval signal representing the time between pulses (from the end of a pulse to the beginning of the next pulse) of a pulse train divided by the time from the beginning of a pulse to the beginning of the next pulse in the same pulse train.

4,255,624

CALL PROCESSING MONITOR SYSTEM

Richard A. Walton, Bensenville, and John Mocko, Jr., Itasca, both of Ill., assignors to GTE Automatic Electric Laboratories Incorporated, Northlake, Ill.

Filed Nov. 23, 1979, Ser. No. 97,081
Int. Cl.³ H04M 3/22
U.S. Cl. 179—175.2 D **9 Claims**



1. A call processing monitor system for dynamically verifying the operation of a telephone switching center including initialization means, a plurality of originating lines each connected to said switching center and a plurality of terminating lines each connected to said switching center, said call processing monitor system comprising:

means for selecting one of a plurality of said originating lines, said selecting means operated in response to said initialization means;

dial tone detection means connected to each of said plurality of originating lines and operated to detect application of dial tone by said switching center;

second means for selecting digit values representing a telephone directory number operated in response to said operation of said dial tone detection means;

means for transmitting said digit values connected to said second selecting means;

means for sequencing said digit values for transmission connected to said transmission means;

ring detection means connected to said terminating line and operated to detect a complete path from said originating line to said terminating line through said switching center;

answer means connected to said ring detection means and operated in response to said operation of said ring detection means to produce a signal representing an off-hook condition;

test tone generation means connected to said answer means and operated in response to said off-hook condition to produce a test tone of a particular frequency;

delay means connected to said answer means and operated in response to said off-hook condition to connect said generated test tone to said terminating line;

test tone detection means connected to said originating line for detection of said complete path through such switching center whereby a first output signal is produced representing the detection of said complete path;

timing means connected to said initialization means and to said test tone detection means, said timing means operated to time a predetermined interval whereby upon expiration of said interval a second output signal of a first characteristic is produced and alternatively for detection of said test tone a second output signal of a second characteristic is produced;

shift register means connected to said timing means and operated in response to a plurality of said second output signals to detect an alternate failure pattern of test calls whereby for said detection of said failure pattern a third output signal is produced; and

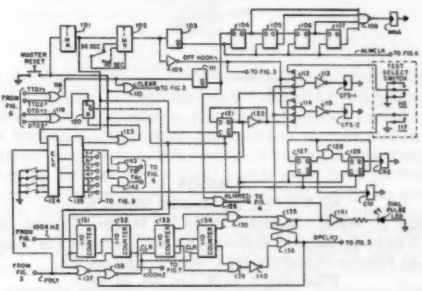
latching means connected to said shift register means and operated in response to said third output signal to produce a fourth output signal operable to generate an indication of said alternate failure pattern.

4,255,625

CALL PROCESSING MONITOR SYSTEM

Richard A. Walton, Bensenville, and John Mocko, Jr., Itasca, both of Ill., assignors to GTE Automatic Electric Laboratories Incorporated, Northlake, Ill.

Filed Nov. 23, 1979, Ser. No. 97,082
Int. Cl.³ H04M 3/22
U.S. Cl. 179—175.2 D **10 Claims**



1. A call processing monitor system for dynamically verifying the operation of a telephone switching center including initialization means, a plurality of originating lines each connected to said switching center and a plurality of terminating lines each connected to said switching center, said call processing monitor system comprising:

means for selecting one of a plurality of said originating lines, said selecting means operated in response to said initialization means;

dial tone detection means connected to each of said plurality of originating lines and operated to detect application of dial tone by said switching center;

second means for selecting digit values representing a telephone directory number operated in response to said operation of said dial tone detection means;

means for transmitting said digit values connected to said second selecting means;

means for sequencing said digit values for transmission connected to said transmission means;

ring detection means connected to said terminating line and operated to detect a complete path from said originating line to said terminating line through said switching center;

answer means connected to said ring detection means and operated in response to said operation of said ring detection means to produce a signal representing an off-hook condition;

test tone generation means connected to said answer means and operated in response to said off-hook condition to produce a test tone of a particular frequency;

delay means connected to said answer means and operated in response to said off-hook condition to connect said generated test tone to said terminating line;

test tone detection means connected to said originating line for detection of said complete path through such switch-

ing center whereby a first output signal is produced representing the detection of said complete path;

timing means connected to said initialization means and to said test tone detection means, said timing means operate to time a predetermined interval whereby upon expiration of said interval a second output signal of a first characteristic is produced and alternatively for detection of said test tone a second output signal of a second characteristic is produced;

threshold counting means connected to said timing means and operated in response to a plurality of second output signals of a said first characteristic to detect a consecutive accumulation of said second output signals whereby a third output signal is produced representing said consecutive accumulation attaining a predetermined threshold limit; and

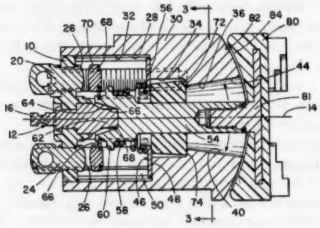
latching means connected to said threshold counting means and operated in response to said third output signal to produce a fourth output signal representing an indication of consecutive failures of said call processing monitor system.

4,255,626

MULTIPLE POSITION SWITCH

Roger E. Watts, Chicago; William W. Wright, Wheaton, and William J. Donarski, Bellwood, all of Ill., assignors to Guardian Electric Manufacturing Company, Chicago, Ill.

Filed Aug. 9, 1979, Ser. No. 65,096
Int. Cl.³ H01H *19/00, 19/06*
U.S. Cl. 200—6 A **8 Claims**



1. In a multiple contact switch of the type including a base with a center support and a pivot stud projecting therefrom, a separate shaft pivotally mounted on the stud and defining an axis, a housing mounted over the base and shaft, means for manually moving the shaft from axial alignment, at least one contact member attached to the shaft and spaced radially from the axis of the shaft for movement in response to pivoting movement of the shaft, said contact member cooperative with a fixed contact member upon sufficient pivotal movement of the shaft from axial alignment, the improvement comprising:

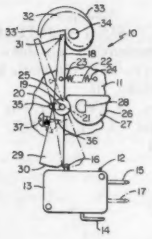
an annular elastomeric washer on the shaft cooperative with a recess in the housing to bias the shaft toward axial alignment, said elastomeric washer being positioned within a conical counterbore opening of the housing defining the recess, said washer defining a conical surface of lesser radial dimension than the conical surface of the counterbore within the housing whereby said surfaces are spaced during axial position of the shaft.

4,255,627

ELECTRICAL SWITCH CONSTRUCTION HAVING AN ADJUSTABLE PIVOTING ACTUATOR THEREFOR AND METHOD OF MAKING THE SAME

Edgar E. Marquis, Newtown, Conn., assignor to Robertshaw Controls Company, Richmond, Va.

Filed Jan. 16, 1979, Ser. No. 3,817
Int. Cl.³ H01H *43/04*
U.S. Cl. 200—38 R **20 Claims**



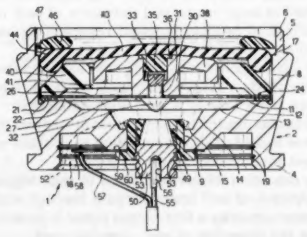
1. In an electrical switch construction having a stationary frame means carrying an electrical switch provided with different operating conditions, said construction having an actuator pivotally mounted directly in said frame means and operatively associated with said switch for operating said switch to said different conditions thereof in accordance with the pivot position of said actuator about its pivot point in said frame means, said construction having a timer member operatively associated with said actuator for repetitively pivoting said actuator about its said pivot point to cause said switch to be repetitively in one condition thereof a certain percentage of a certain increment of time and for being in another condition thereof for the remainder of said certain increment of time, said construction having means for selecting the amount of said certain percentage of said certain increment of time within certain limits, the improvement wherein said means is operatively associated with said actuator for changing its said pivot point in said frame means and in relation to said switch and thereby selecting said amount of said certain percentage.

4,255,628

INSUFFICIENT PRESSURE DETECTOR DEVICE FOR MOTOR VEHICLE TIRES

Costantino Broetto, Milan, Italy, assignor to Fratelli Borletti S.p.A., Milan, Italy

Filed Aug. 17, 1978, Ser. No. 934,761
Claims priority, application Italy, Sep. 27, 1977, 53514 B/77
Int. Cl.³ H01H *35/24*
U.S. Cl. 200—61.25 **5 Claims**



1. A device for detecting when a critical value of inflation pressure within an inflated vehicle tire casing mounted on a rim has been overcome, said rim having an opening therethrough, said device comprising a cup-shaped body adapted to

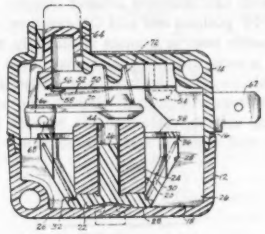
be disposed in the tire casing and to be connected to the said opening, said body having an aperture facing said tire casing and a bottom wall with a through hole, a flexible diaphragm connected to said cup-shaped body to close said aperture in an air-tight manner, said flexible diaphragm being adapted to take on two different shapes when the inflation pressure changes from one value to another value across the critical value, a first electric contact housed inside the through hole of the bottom wall of said cup-shaped body, a second electric contact, annular elastic means fastened peripherally to said cup-shaped body and supporting axially said second electric contact in an intermediate position between said first electric contact and said diaphragm to cause the second electric contact to be pushed continuously against said diaphragm so as to move together with it, said first and second electric contacts being contacted where said diaphragm has one of the said shapes but not when it has the other shape, and annular bimetallic means provided with a plurality of radial projections turned inwards, said bimetallic means being fastened peripherally to said body and housed between said body and said elastic means and being made of at least two metal materials having a different coefficient of thermal expansion, so that an increase of temperature of the air within the tire casing causes an increase of pressure thrust exerted on the surface of the diaphragm facing the tire casing, and a substantially identical increase of pressure thrust exerted on the opposite surface of the diaphragm from said bimetallic means through said second electric contact.

4,255,629

CRASH AND ROLLOVER CUTOFF SWITCH

Lon E. Bell, Altadena, Calif., assignor to Technar Incorporated, Arcadia, Calif.

Filed Apr. 9, 1979, Ser. No. 28,580
Int. Cl.[3] H01H *35/14*
U.S. Cl. 200—61.45 R **12 Claims**



1. A switching device comprising:

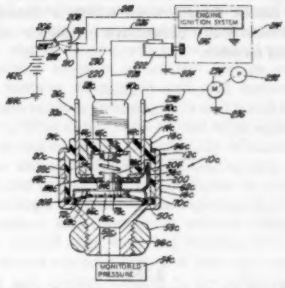
a housing, an inertial member including a movable weight and guide means normally supporting the weight in the housing, the weight being freely movable relative to the guide means along a linear axis when the inertial member is inverted; means pivotally mounting the guide means in the housing with said linear axis normally extending vertically through the center of gravity of said weight, the guide means pivoting about a point offset from the center of gravity of the weight, whereby an accelerating force acting in a direction transverse to said linear axis causes the guide means and the weight to tilt as a unit about the pivot point and a force acting parallel to the linear axis moves the weight relative to the guide means along said axis; spring means urging the guide means into a predetermined angular position relative to the housing, the tilting of the guide means in any direction about the pivot point being resisted by the spring means; and means activating the switch means in response to movement of the weight with tilting of the guide means or movement of the weight along said axis.

4,255,630

MULTI-CIRCUIT ELECTRICAL SWITCH

Charles J. Hire, and Gary L. Deppe, both of Mansfield, Ohio, assignors to Hi-Stat Manufacturing Company, Inc., Lexington, Ohio

Filed May 29, 1979, Ser. No. 42,771
Int. Cl.[3] H01H *35/34*
U.S. Cl. 200—81.4 **33 Claims**



1. An electrical switch assembly, comprising housing means, pressure responsive diaphragm means carried by said housing means, a first electrically conductive fixed member carried by said housing means, passage means formed through said first electrically conductive fixed member, movable actuator means extending through said passage means as to have portions thereof disposed at oppsoite sides of said first electrically conductive fixed member, a second electrically conductive fixed member carried by said housing means and spaced from said first electrically conductive fixed member, movable electrical contact means carried by said actuator means and situated as to be generally between said first electrically conductive fixed member and said second electrically conductive fixed member, said diaphragm means having one side thereof generally juxtaposed to said actuator means and an other side thereof opposite to said one side effective to be exposed to a monitored fluid pressure, said diaphragm means when experiencing a sufficient pressure thereagainst from said monitored fluid pressure being effective to move said actuator means and said movable electrical contact means toward said second electrically conductive fixed member as to thereby have said movable electrical contact means and said second electrically conductive fixed member in operative engagement with each other when said diaphragm means is not experiencing said sufficient pressure said actuator means and said movable electrical contact means move in a direction generally away from said second electrically conductive fixed member and result in said movable electrical contact means engaging said first electrically conductive fixed member, a third electrically conductive fixed member carried by said housing means, said third electrically conductive fixed member being situated as the result in said third electrically conductive fixed member being operatively engaged by said movable electrical contact means whenever said movable electrical contact means operatively engages said second electrically conductive fixed member, a fourth electrically conductive fixed member carried by said housing means, said fourth fixed member being spaced from said movable electrical contact means and located at a side thereof which is opposite to the side of said movable electrical contact means at which said first electrically conductive fixed member is located, and electrically conductive connector means electrically interconnecting said fourth fixed member and said movable electrical contact means, wherein said movable electrical contact means comprises at least first and second separate electrically conductive paths, said electrically conductive connector means being in continuous electrical contact with said first separate electrically conductive path as to thereby complete an electrical circuit from said fourth fixed member

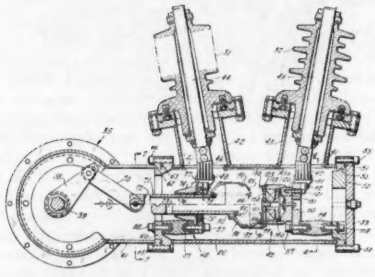
through said first fixed member whenever said movable electrical contact means moves into operative engagement with said first fixed member and causes operative electrical engagement as between said first separate electrically conductive path and said first fixed member, said movable electrical contact means being effective when moved into operative engagement with said second and third fixed members to cause said second separate electrically conductive path to operatively electrically engage said second and third fixed members as to close an electrical circuit therebetween which is electrically isolated from said electrically conductive connector means and said fourth fixed member.

4,255,631

EXTERIOR CONNECTED ARC RUNNER FOR ARC SPINNER INTERRUPTER

Robert K. Smith, Lansdale, Pa., assignor to Gould Inc., Rolling Meadows, Ill.

Filed Jan. 11, 1978, Ser. No. 868,622
Int. Cl.[3] H01H *33/18*
U.S. Cl. 200—147 R **17 Claims**



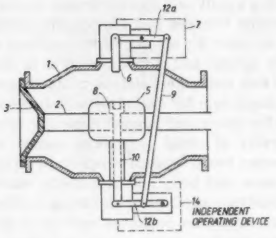
1. A circuit interrupter comprising a stationary contact assembly; a movable contact assembly; a dielectric gasfilled housing containing said stationary and movable contact assemblies; said stationary contact assembly including an arc runner contact and an electrical coil and circuit connection means for connecting means said electrical coil in series with said arc runner contact; said arc runner contact comprising a generally flat conductive disk having an axis which is coaxial with the axis of said coil, said arc runner contact having a flat annular surface which is the only surface of said arc runner control exposed to an arc; said coil being disposed adjacent one surface of said arc runner contact which is opposite said flat annular surface and being in a plane parallel to the plane of said arc runner contact and being closely magnetically coupled to said arc runner contact; said movable contact assembly including a generally cylindrical arcing contact which is coaxial with said arc runner contact, and which is movable into and out of contact with said flat annular surface of said arc runner contact; said circuit connection means being connected to the outer diameter of said arc runner contact, such that the current path from said arc runner contact and into an arc extending from said flat annular surface of said arc runner contact to said arcing contact will execute a bend which produces a magnetic force which tends to bend the arc toward the axis of said arc runner contact.

4,255,632

GROUNDING SWITCH FOR GAS-INSULATED HIGH VOLTAGE SWITCHGEAR

Hans Backskog, Ludvika, Sweden, assignor to ASEA Aktiebolag, Vesteras, Sweden

Filed Jul. 3, 1978, Ser. No. 921,184
Claims priority, application Sweden, Jul. 8, 1977, 7707986
Int. Cl.[3] H01H *33/00*
U.S. Cl. 200—148 R **7 Claims**



1. Grounding switch in combination with a gas-insulated, metal-enclosed, high voltage switchgear, comprising:

a movable switch contact in permanent connection with a grounded enclosure of the switchgear;

at least one phase conductor;

a movable counter contact permanently connected to said at least one phase conductor;

a metal screen surrounding said phase conductor in the region of said movable counter contact;

a first operating device for displacement of said movable switch contact between an OFF-position and an ON-position for grounding said switchgear, with said movable switch contact in non-contacting and contacting relationship with said movable counter contact, respectively in said OFF-position and said ON-position;

said movable counter contact is centrally mounted in said metal screen, and being arranged, upon closing of said movable switch contact to said ON-position, to be displaced from said screen towards said movable switch contact, said movable counter contact being retracted within said screen in said OFF-position.

4,255,633

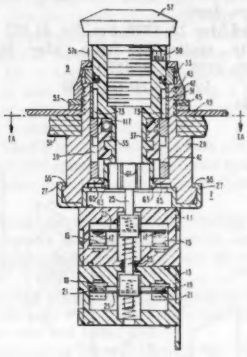
PUSH-PULL SWITCH OPERATOR

Robert J. Johnston, Patterson Heights; Stephen G. Layciak, Brighton Township, Beaver County, and George M. Cametti, Beaver, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jun. 4, 1979, Ser. No. 45,449
Int. Cl.[3] H01H *15/24*
U.S. Cl. 200—153 J **6 Claims**

1. A push-pull switch operator comprising separable switch contacts, a contact operating member, a housing, an actuating structure movable longitudinally within the housing and between first and second positions for reciprocally moving the member, means resiliently urging said structure toward at least one of the first and second positions between the housing and said structure, the means comprising a collar yieldingly movable in a circumferential path about an outer peripheral surface of said structure, cam surface means fixedly mounted adjacent to the collar, a cam follower on the collar and engaging the

cam surface means, the cam having a camming surface inclined to the longitudinal direction of movement of the structure, and



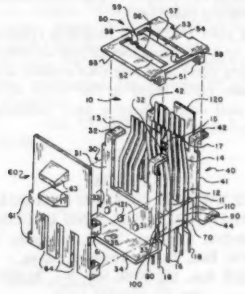
bias means for biasing the cam follower against the camming surface to effect longitudinal movement of the structure.

4,255,634

CAM ACTUATED SWITCHING DEVICE

David L. Vonder, Addison, Ill., assignor to GTE Automatic Electric Laboratories Incorporated, Northlake, Ill.

Filed Oct. 1, 1979, Ser. No. 80,818
Int. Cl.³ H01H *3/42*
U.S. Cl. 200—153 LA **13 Claims**



1. A switching device comprising:

a first plurality of pairs of contact springs, each contact spring of each of said pairs of contact springs including a fixed and electrically insulated from one another and a free end, each of said free ends in spaced relationship with one another and each including a contact surface on a portion of said free ends and said contact surfaces engaging one another, a second plurality of pairs of contact springs each pair of second plurality of pairs of contact springs directly opposite and in a spaced registration with a respective pair of said first plurality of contact springs, each contact spring of each of said second pairs of contact springs including a fixed end electrically insulated from one another and a free end, each of said free ends in spaced relationship with one another and each including a contact surface on a portion of said free end, and said contact surfaces engaging one another;

a first support bracket having said plurality of first and second pairs of contact springs secured thereat, said first support bracket electrically insulated and in spaced relationship with said first plurality of pairs of contact spings, said first support bracket including a pair of legs in spacial and co-planar relationship with one another in a mutual orientation with said plurality of first and second pairs of contact springs, each of said legs including a guide portion oriented perpendicular to said legs;

a follower slideably mounted and displaceable along said guide portions and including electrically insulated first and second edges, said edges transversely oriented between said plurality of first and second pairs of contact springs, said first edge including at least one notched portion of a first depth and said notch arranged in registration with a selected one of said pairs of contact springs, said first edge in contact with a first contact spring of said first plurality of pairs of contact springs urging said contact surfaces disengaged and said selected pair of contact springs in registration with said notch having said contact surfaces closed, said second edge adjacent a first contact spring of said second plurality of contact springs;

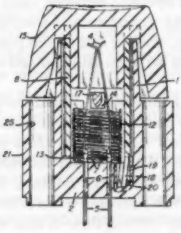
an actuator slideably mounted and displaceable along said first support bracket legs perpendicular to said follower and including a cam portion for engaging said follower so as to displace said follower to enforce contact of said follower second edge with said plurality of first contact springs of said second plurality of pairs of contact springs allowing said contact surfaces to disengage and simultaneously displacing said follower first edge out of contact with said first contact springs of said first plurality of pairs of contact springs allowing engagement of said contact surfaces.

4,255,635

KEYSWITCH

Dudley H. Campbell, Raleigh; James A. Daggerhart, Cary, and Arthur W. Overton, Raleigh, all of N.C., assignors to Stackpole Components Company, Raleigh, N.C.

Filed Sep. 17, 1979, Ser. No. 75,945
Int. Cl.³ H01H *3/12, 13/52*
U.S. Cl. 200—159 A **6 Claims**



1. A keyswitch comprising a rectangular housing having a bottom wall and an open upper end, a plunger having a rectangular tubular body extending downwardly in the housing and slidably engaging said housing for movement up and down therein, means limiting upward travel of the plunger to a predetermined elevated position, the lower end of said body being spaced above said bottom wall while the plunger is in said elevated position, said bottom wall being provided with a pair of laterally spaced openings extending substantially vertically therethrough, a pair of spring contact strips rigidly mounted in said openings and projecting below said wall to form terminals, said contact strips also extending up inside the plunger and having normally engaging upper ends, a cross member inside the plunger body and supported thereby between the contact strips, and a coil spring inside the plunger below said cross member and encircling the contact strips but spaced therefrom, the top of said bottom wall being provided with a central recess receiving and positioning the lower end of the spring, said spring normally holding the plunger in said elevated position with said cross member spreading the upper ends of the

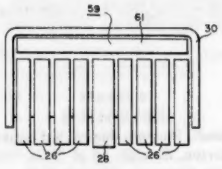
contacts apart, said downward movement of the plunger in said housing disengaging said cross member from the contacts, the plunger body having legs extending downwardly from its lower corners to slidably engage said housing between said body and bottom wall while the plunger is elevated, and the corners of said bottom wall being provided outwardly of said recess with downwardly extending sockets for receiving said legs when said plunger is depressed.

4,255,636

CIRCUIT BREAKER WITH CURRENT CARRYING CONDUCTOR SYSTEM UTILIZING EDDY CURRENT REPULSION

John A. Wafer, Monroeville; Paul P. Koren, Canonsburg, and Thomas N. Meyer, Murrysville, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Dec. 30, 1976, Ser. No. 755,776
Int. Cl.³ H01H *1/54*
U.S. Cl. 200—250 **4 Claims**



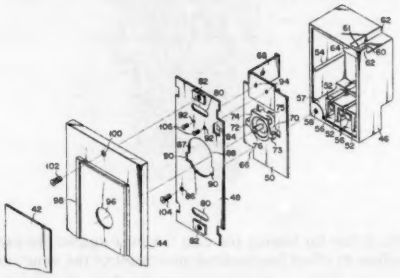
1. A circuit breaker comprising:
first and second spaced-apart stationary contacts;
a movable contact pivotally connected to said first stationary contact and operable between open and closed positions with respect to said second stationary contact, said movable contact, when in said closed position, conducting electrical current between said first and second stationary contacts,
means for effecting movement of said movable contact between said open and closed positions; and
a repulsion member made of an electrically conducting material disposed adjacent said movable contact distal from said second stationary contact, the current flow through said movable contact when in said closed position including an eddy current flow in said repulsion member causing a magnetic repulsion force between said repulsion member and said movable contact, said magnetic repulsion force moving said movable contact into increased pressure engagement with said second stationary contact;
said first stationary contact having a circular segment at one end thereof; and said movable contact having a circular portion removed therefrom at an end adjacent said first stationary contact, said movable contact having a longitudinal slot extending from said removed circular portion forming a pair of parallel current conducting members, said first stationary contact circular segment being disposed within said movable contact removed circular portion such that said movable contact pivotally engages said first stationary contact circular segment, said movable contact, when in said closed position, having current flow through said parallel conducting members to said first stationary contact, the flow of current through said parallel conducting members to said first stationary contact resulting in increased engagement pressure of said movable contact to said first stationary contact circular segment.

4,255,637

LIGHT REGULATOR SWITCH

Takehiko Matsuda, Matsudo, Japan, assignor to Toyostar Corporation, Tokyo, Japan

Filed May 22, 1979, Ser. No. 41,323
Claims priority, application Japan, May 26, 1978, 53-71220[U]; Oct. 19, 1978, 53-143927[U]
Int. Cl.³ H01H *9/08*
U.S. Cl. 200—293 **11 Claims**



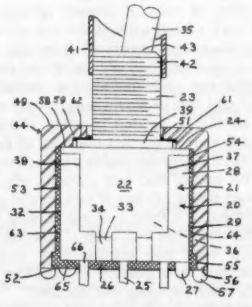
1. A light regulator switch comprising:
a generally rectangular radiating plate (**48**) including a bent engaging member (**84**) at only one corner of the back side thereof and a hole (**86**) at another corner diagonally opposite to said one corner,
a case (**46**) including detaining means (**60**) in and with which the bent engaging member (**84**) of said radiating plate (**48**) is vertically slid to be received and engaged, and a hole (**58**) adapted to be brought to alignment with said hole (**86**) of said radiating plate (**48**),
said radiating plate (**48**) being rotatable relative to said case (**46**) about said detaining means (**60**) to bring said holes of said radiating plate and case into mutual alignment, and
coupling means (**104**) fitted in the holes of said radiating plate and said case, whereby said radiating plate is securely coupled with said case.

4,255,638

MINIATURE SWITCH, SEALED FOR SOLDERING, WITH HANDLE HOUSING EXPOSED

Alfred F. Contarino, Andover, Mass., assignor to Alco Electronic Products, Inc., North Andover, Mass.

Filed Apr. 13, 1979, Ser. No. 30,020
Int. Cl.³ H01H *9/04*
U.S. Cl. 200—302 **6 Claims**



1. A miniature toggle switch sealed for flow soldering, said switch comprising;
an outer case having four side walls, a top wall with an

aperture therein and an open bottom, said case defining an enclosure;

an inner switch case and frame mounted within said enclosure and having four side walls, said walls having a predetermined clearance space of substantially uniform width, from the corresponding side walls of said outer case;

said inner switch case and frame having a toggle handle housing, for a toggle handle, projecting through said aperture in said top wall and having a bottom with a plurality of conductive terminals thereon projecting from said open bottom of said outer case,

said toggle handle housing having a base portion within the aperture of said apertured top wall and spaced at a predetermined clearance of substantially uniform width therefrom,

an annular bead of sealing material extending around, and in intimate contact with said base portion within said aperture and filling said clearance to seal the top wall of said outer case

a layer of sealing material entirely filling the clearance space between the side walls of said outer case and side walls of said inner case and frame and

a layer of said sealing material entirely convering the bottom of said inner switch case and frame

whereby said inner case and frame is substantially encapsulated to seal the same against solder, flux, and cleaning solvents and said toggle handle housing and toggle handle are exposed for normal use;

a groove of increased dimensions extending around the inside of the rim of the open bottom of said outer case,

said groove being entirely filled with said sealing material to further assure sealing of said switch.

4,255,639

MICROWAVE OVEN WITH A PROGRAMMABLE DIGITAL CONTROL CIRCUIT

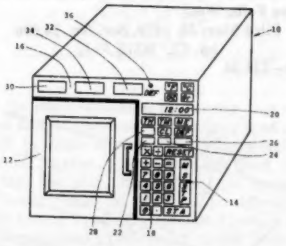
Tsuneo Kawabata, Osaka; Minoru Makita, Higashiosaka, and Sigeaki Masuzawa, Yamatokoriyama, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Apr. 29, 1977, Ser. No. 792,222

Claims priority, application Japan, Apr. 29, 1976, 51-49166; Apr. 30, 1976, 51-50606

Int. Cl.[2] H05B *9/06*

U.S. Cl. 219—10.55 B **19 Claims**



1. A programmable digital control circuit for controlling magnetron operation in a microwave oven including a cooking temperature detection means comprising:

a digital input means for introducing first digital information related to cooking modes, each mode representing a corresponding output value of microwave energy, and second digital information representative of a cooking temperature to be maintained;

digital storage means for storing said first and second digital information introduced from said digital input means;

a temperature comparing means for comparing a temperature set in said digital storage means with a cooking temperature detected by said cooking temperature detection means; and

means for developing a microwave generation controlling signal in response to the combination of said first digital information representative of a selected cooking mode introduced through said digital input means and stored in said digital storage means and an output signal of said temperature comparing means; and wherein:

said digital input means further includes means for introducing digital time information representing a cooking time period;

said digital storage means stores the digital time information introduced from the digital input means thereby providing a plurality of outputs indicative of said cooking time period, said cooking mode, and said cooking temperature to be maintained;

a time interval calculation means is provided which is responsive to the introduction of said digital time information to said digital storage means to initiate a time interval count;

a time period agreement detection means is provided for comparing the cooking time period stored in said digital storage means with a time period count provided by said time interval calculation means and providing an output signal when said count represents said cooking time period;

said microwave generation controlling signal is further responsive to output signals from said time period agreement detection means;

said programmable digital control circuit further comprises detection circuit means for detecting each of a plurality of outputs from said digital storage means and for generating a plurality of unique output signals indicative of said cooking time period, a specific one of said cooking modes, and said cooking temperature, respectively;

said time interval calculation means comprises a counter means for providing said count representative of elapsed time in response to receipt of a first one of said unique output signals from said detection circuit means;

memory means are provided for storing outputs from said detection circuit means;

said cooking time period and said cooking temperature stored in said digital storage means is transferred from said digital storage means passing through said detection circuit means and is stored in said memory means;

said time period agreement detection means comparing said count of said counter means with said cooking time period stored in said memory means thereby generating a time period agreement output signal indicative of the coincidence of the count of said counter means with said cooking time period stored in said memory means;

said temperature comparing means compares said cooking temperature stored in said memory means with an output signal from said cooking temperature detection means thereby generating a temperature agreement output signal indicative of the coincidence of said cooking temperature in said memory means with the temperature indicated by said cooking temperature detection means;

flip-flop means are provided, responsive to said plurality of unique output signals from said detection circuit means for generating set signals in response thereto;

said magnetron operation controlling signal is generated in response to receipt of said set signals from said flip-flop means thereby operating said magnetron;

said flip-flop means generates reset signals in response to receipt of output signals from said time period agreement detection means or from said temperature comparing means, respectively; and

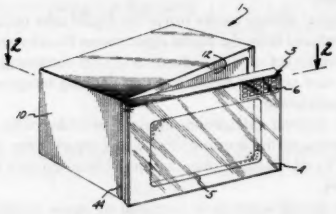
said magnetron operation controlling signal is terminated in response to receipt of said reset signals from said flip-flop means.

4,255,640

DOOR MOUNTED OVEN CONTROLS

Peter W. Bressler, Philadelphia, Pa., assignor to Litton Systems, Inc., Beverly Hills, Calif.

Filed Oct. 19, 1979, Ser. No. 86,497
Int. Cl.[3] H05B 6/66
U.S. Cl. 219—10.55 B 7 Claims



1. In a microwave oven having a housing member, electrically controllable components mounted therein, a cooking cavity mounted interior to said housing member, and a door for covering said cavity having axial mounting means for axially mounting said door on said housing member, the improvement comprising:

manually operable controls mounted on said door for controlling said electrically controllable components; and

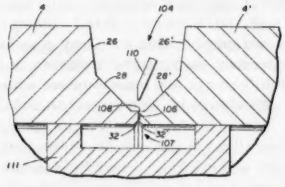
connecting means for operably connecting said controls with said components.

4,255,641

METHOD OF OUTSIDE WELDING OF PIPELINES

Talbert D. Connell, Conroe, and Eugene F. Sims, Houston, both of Tex., assignors to Crutcher Resources Corporation, Houston, Tex.

Filed May 8, 1978, Ser. No. 903,398
Int. Cl.[3] B23K 31/06
U.S. Cl. 219—61 6 Claims



1. In a method of welding together pipe sections in end-to-end relationship of the type involving the steps of beveling the edges of the ends of the pipe sections to form contact bands having flat annular faces, positioning the pipe sections end-to-end with the annular faces of the respective contact bands in abutment to form circumferential inside and outside grooves, applying a welding arc to the bottom of the outside groove, and advancing the welding arc along the outside groove to deposit weld metal therein and form a welded girth joint between the pipe sections, the improvement comprising:

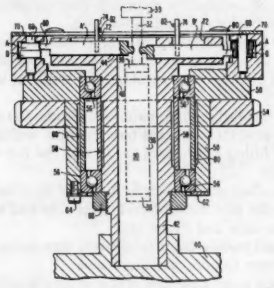
before the step of positioning the pipe sections end-to-end, knurling the annular face of the contact band of at least one of the pipe sections to enhance weld penetration from the outside groove to the inside groove and thereby eliminate provision of an initial welding pass about the inside groove.

4,255,642

METHOD AND APPARATUS FOR TIPPING OFF REFRACTORY METAL TUBULATION

Phillip A. Livera, Bloomfield, N.J., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Apr. 30, 1979, Ser. No. 34,313
Int. Cl.[3] B23P 1/00
U.S. Cl. 219—68 12 Claims



1. A method for tipping off the arc tube refractory metal tubulation of a high pressure sodium discharge lamp comprising the steps of:

inserting the tubulation into a machine having a plurality of pairs of radially extending diametrically opposed tipping jaws extending normal to said tubulation;

actuating said plurality of radially extending pairs of tipping jaws sequentially with a plurality of rollers having sequentially increasing diameters thereby causing said tipping jaws of said pairs to repetitively squeeze said tubulation into an increasingly smaller diameter;

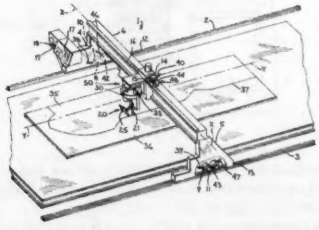
removing said tubulation from said machine and passing sufficient electric current through said tubulation to cause separation thereof at said area of smaller diameter.

4,255,643

PROGRAMMED WELDING MACHINE WITH CONTINUOUSLY MONITORED OVERRIDE CONTROL

Fredrick J. Balfanz, Waukesha, Wis., assignor to C-R-O, Inc., Menomonee Falls, Wis.

Filed Mar. 28, 1979, Ser. No. 24,696
Int. Cl.[3] B23K 9/12
U.S. Cl. 219—124.34 12 Claims



1. In a welding machine for joining a plurality of stationary metal pieces along a groove formed therebetween:

(a) a machine support mounted for movement along a Y axis,

(b) a machine carriage mounted to said support for movement along an X axis,

(c) a rotator suspended beneath said carriage and with said rotator being rotatable about a C axis disposed generally perpendicular to the said X and Y axes,

(d) a weld head suspended beneath said carriage for forming a weld in said groove,

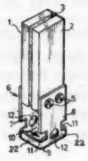
(e) a sensor suspended beneath said carriage for following the contour of said groove in advance of said weld head,
(f) said weld head and said sensor being spaced from each other and said C axis on a straight line extending through said C axis and being rotatable together with said rotator about said C axis,
(g) first and second motive means:
(1) to selectively drive said support and said carriage along their respective axes, and
(2) to rotate said rotator about said C axis,
(h) said first and second motive means being actuatable in response to an input control unit to cause said sensor and weld head to traverse a programmed path generally corresponding to that of said groove,
(i) and program override means connected to said rotator and responsive to a deviation in said groove perpendicular to the said programmed path and sensed by said sensor to cause said rotator and said weld head to move from said programmed path to a corrected path which is in correspondence with the actual path formed by said groove.

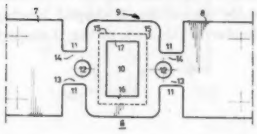
4,255,644

MICRO-SOLDERING TOOL

Raymond L. Delorme, Bagnolet, France, assignor to Compagnie Internationale l'Informatique-CUU Honeywell Bull, Paris, France

Filed Apr. 12, 1978, Ser. No. 895,791
Claims priority, application France, Apr. 29, 1977, 77 13025
Int. Cl.³ B23K *3/02*; H05K *13/04*; H05B *3/24*
U.S. Cl. 219—233 **7 Claims**





1. A tool for micro-soldering connecting tags of an integrated circuit chip to corresponding terminals of conductors on a substrate by Joule heating comprising a high electrical conductivity bit having a bottom planar face adapted to contact the tags and press them against the terminals while applying sufficient heat to the tags to solder them to the terminals, said face having a centrally apertured portion adapted to receive and accomodate an integrated circuit chip, said apertured portion forming a geometrical loop on said planar face, said loop having first and second opposite sides spaced from each other and adapted to contact the connecting tags of the integrated circuit chip, first and second high electrical conductivity strips extending from first and second intersections with first and second opposite sides of the bit, said first and second strips respectively applying and removing current from the opposite sides of the face so that a pair of symmetrical current half loops extend about the geometrical loop between said opposite sides, each of said strips having a reduced cross-sectional area in proximity with its intersection with the bit, said bit having a continuous upstanding peripheral flange to provide rigidity to the bit, the reduced cross-sectional area of said first and second strips being respectively symmetrical with respect to said first and second sides and being removed from the intersection of the strip with the bit so that cross-sectional area of the reduced area is less than the strip at its intersection with the bit

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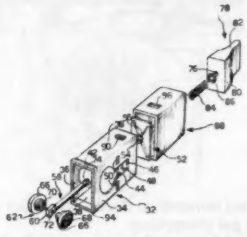
4,255,645

ELECTRIC CIGARETTE-LIGHTER DEVICE

Alberto Vitaloni, Turin, Italy, assignor to Squirrel S.p.A., Cambiano, Italy

Filed Oct. 11, 1979, Ser. No. 83,716
Claims priority, application Italy, Mar. 5, 1979, 53037/79[U]
Int. Cl.³ F23Q *7/22*
U.S. Cl. 219—267 **10 Claims**



1. An electrical cigarette-lighter device, of the type comprising:
an elongate hollow support body, open at a first end and supporting internally, close to a second end, a collet comprising a bimetallic lamina shaped substantially in the form of a U and providing a pair of jaws interconnected by a yoke, said yoke being secured to said body,
two electrical terminals supported on said body, a first one of said terminals being electrically connected to said yoke,
an elongate coupling sleeve insertable into the body,
a movable assembly slidably mounted within the coupling sleeve and comprising a push-button which, with the coupling sleeve inserted into the body, protrudes from the open end of the body, and a burner in the form of a metal cap containing an electrical resistance element providing a front face for the burner against which a cigarette to be lit can be applied, one end of said resistance element being electrically connected to the cap and the other end being arranged for connection to a second one of said electrical terminals, and
biasing means reacting between the coupling sleeve and the movable assembly such that with the coupling sleeve inserted into the body, the biasing means is operative to urge said assembly away from the said second end of the body into a first position in which the burner cap is out of engagement with the jaws of the collet, the movable assembly being displaceable, by pressing of the pushbutton, against the force of the biasing means into a second position in which the periphery of the cap is engaged and held by the jaws of the collet and the resistance element is electrically energised, the heat emitted by the energised resistance element causing the jaws of the collet to heat up and open out thereby freeing the cap and enabling the movable assembly to return to its first position under the urging of said biasing means, characterised in that,
the coupling sleeve has a sidewall defining at least one aperture and the burner is arranged with its front facing towards this side wall, the yoke of the collet being secured to the said side wall with the two jaws extending transversally inside the body, and the movable assembly being so arranged that in its first position the front face of the burner is situated in correspondence with the aperture, and in the second position of the movable assembly in which the periphery of the cap is engaged and held by the jaws, the front face of the burner faces the yoke of the said collet.

4,255,646

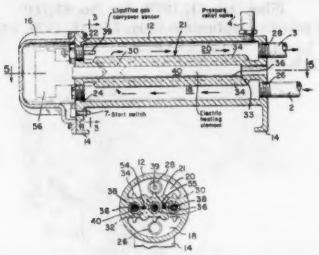
ELECTRIC LIQUEFIED PETROLEUM GAS VAPORIZER

Jens T. Dragoy, and Bruce D. Densmore, both of Seattle, Wash., assignors to Sam Dick Industries, Inc., Seattle, Wash.

Filed Mar. 3, 1978, Ser. No. 882,974

Int. Cl.[3] F17C *7/02;* **F22B** *1/28;* **F23D** *11/44;* **C10G** *9/24*

U.S. Cl. 219—275 **14 Claims**



1. A compact economical electric vaporizer unit for vaporizing liquefied gas comprising:

an elongated heat-conductive casting having a longitudinally extending internal cavity bridged by an integral longitudinal divider dividing the cavity into separate elongated chambers, the casing serving both as a pressure vessel for the liquefied gas and a heat interface between a source of heat and the liquefied gas,

multiple passageways through one end of the divider interconnecting the separate chambers, the passageways being sufficiently small relative to the dimension of each of the chambers and configured to create turbulence and disperse the liquefied gas into small droplets which rapidly flash to gas vapor,

a liquefied gas inlet opening in the casting at a location remotely spaced from the multiple passageways and communicating with one of the chambers,

a gas vapor outlet opening in the casing adjacent the inlet opening and remotely spaced from the multiple passageways and communicating with the other chamber,

at least one passageway in the integral divider, each passageway holding an electric resistance heat unit,

at least one temperature sensing port in the divider, each port receiving a temperature sensing means,

electric power supply means connected to said at least one electric resistance heater unit, and control means responsive to the at least one temperature sensing means and operatively connected to the electric power supply means for regulating the supply of electric power to the at least one heat unit.

4,255,647

WATER TANK HAVING ELECTRIC HEATING ELEMENT AND CATHODIC CORROSION PROTECTION

Hans Rickert, and Günter Holzäpfel, both of Dortmund, Fed. Rep. of Germany, assignors to Vereinigte Elektrizitätswerke Westfalen AG, Dortmund, Fed. Rep. of Germany

Continuation of Ser. No. 764,903, Feb. 1, 1977, abandoned. This application Oct. 25, 1978, Ser. No. 954,424

Claims priority, application Fed. Rep. of Germany, Feb. 10, 1976, 2605089

Int. Cl.[3] H05B *3/82;* **F24H** *1/00;* **C23F** *13/00*

U.S. Cl. 219—322 **5 Claims**

1. An improved anticorrosion protected small electric household water heating tank, comprising:

a metallic household water heating tank having a passive anticorrosive layer provided on an inner wall thereof;

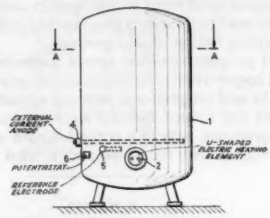
an electric immersion heating element arranged horizontally in a lower region of the tank;

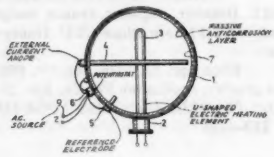
a pair of electrodes supplied with external current for providing cathodic corrosion protection, one of said electrodes being an external current anode arranged substantially at the level of the heating element and extending within said tank, the other electrode being said tank itself;

a reference electrode affixed to a wall of said tank and extending within the lower region of said tank;

electrical power source means; and

a potentiostat, said potentiostat including means connected to the reference electrode and tank for detecting the potential between the reference electrode and tank, means





for comparing the detected potential between tank and reference electrode to a reference voltage and means responsive to a deviation between the detected potential and the reference voltage for adjusting the current flow to the external electrodes from the power source means to maintain an optimum potential between the tank and reference electrode;

wherein said electric heating element is substantially U-shaped and wherein the external current anode is arranged horizontally above the U-shaped heating element and perpendicular to the arms of the U-shaped element.

4,255,648

AQUARIUM HEATER

Allan H. Willinger, 351 E. 84th St. Apt. 21-E, New York, N.Y. 10028, and Tsuyoshi Itakura, Itakura Soki Kabushiki Kaisha, 17-20, Unoki 3-Chome, Ohta-Ku, Tokyo, Japan

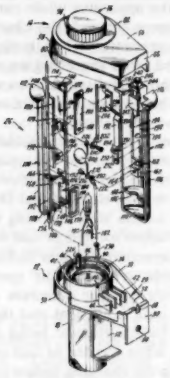
Filed Aug. 2, 1979, Ser. No. 63,049

Int. Cl.[3] H05B *3/80, 1/02*

U.S. Cl. 219—523 **5 Claims**

1. An aquarium heater comprising a housing and a tube depending therefrom, an electrical heating element and a thermostatic control chassis disposed within said tube, the control chassis comprising a bimetallic thermostatic switch comprising a fixed contact member and an adjustable contact member, and adjustment means for adjusting the relative positions of said contact members to thereby control the temperature setting of the heater, said adjustment means comprising an actuator arm vertically slidable within said tube to engage said adjustable contact member and laterally adjust its position, and control means in said housing for controlling the vertical position of

said actuator arm in accordance with the desired temperature setting, said control means comprising a rotatable control



knob, and means for changing rotary motion of the control knob into vertical motion of the actuator arm.

4,255,649

FLEXIBLE HEATING ELEMENTS

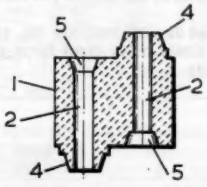
Joseph Fisher, 52 Southover, Daisy Hill, Westhoughton, Bolton, Lancashire, England

Filed Sep. 26, 1979, Ser. No. 79,060

Claims priority, application United Kingdom, Sep. 29, 1978, 38749/78

Int. Cl.³ H05B *3/02*

U.S. Cl. 219—550 **9 Claims**



1. A heating element comprising a plurality of ceramic components strung together on a heating wire to form a flexible structure, adjacent ceramic components comprising integrally formed mating projections and depressions, characterised in that the element comprises ceramic components of a first type each having an integral body defining two generally parallel passages therethrough, both passages in said integral ceramic body terminating at one end in a common slot, one passage terminating at the other end in a depression formed in said ceramic body, and the other passage terminating at the other end in a projection extending integrally from said ceramic body; and ceramic components of a second type having an integral ceramic body defining a passage therethrough terminating at one end in a depression and at the other end in a projection, the components of the first type forming two parallel rows, the components of the two rows being staggered relative to each other, and the components of the second type being arranged to fill spaces formed at the ends of the two relatively staggered rows such that the two rows of components are of substantially the same length and each passage in one row is aligned with a respective passage in the other row, the components being oriented such that the projections and depressions of adjacent rows interengage, and the wire being arranged to pass through the passages in each component and to lie in the slots in the components of said first type.

4,255,650

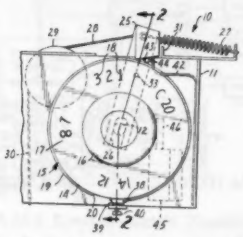
MECHANICAL COUNTER

Norman L. Giorgini, West St. Paul, and John W. Ulseth, Roseville, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Aug. 30, 1979, Ser. No. 71,119

Int. Cl.³ G06M *1/00*

U.S. Cl. 235—91 R **10 Claims**



1. A counting device operative to energize a circuit and maintain said circuit energized for a predetermined number of cycles of operation after which said device will automatically open said circuit, said device comprising

a frame,

a central spindle affixed to said frame,

a ratchet pawl rotatably and slidably mounted on said spindle so as to allow rotation about said spindle during each cycle,

biasing means connected between said pawl and said frame for restoring the original position of said pawl after each cycle,

an indicator knob rotatably and slidably mounted on said spindle, said knob comprising

a ratchet surface formed substantially around its periphery which can be engaged by said pawl to rotate said knob about said spindle,

an axially facing side with a graspable protrusion disposed so as to allow said knob to be manually rotated about said spindle, and

limiting means interacting with said frame for limiting the rotational movement of said knob about said spindle,

biasing means disposed between said frame and said knob for urging said knob to its most distal position from said frame,

releasable latch means disposed for holding said knob in a position proximate to said frame and for releasing said knob upon said pawl rotating said knob to a predetermined position, and

switch means mounted on said frame to be engaged by said knob in said proximate position and actuated by said knob for energizing said circuit during the cycle of operation and de-energizing said circuit upon said completion of said cycle.

4,255,651

SHEET COUNTING METHOD AND APPARATUS

Christopher A. P. Phillips, Fareham, England, assignor to De La Rue Systems Limited, London, England

Filed Sep. 12, 1979, Ser. No. 75,203

Claims priority, application United Kingdom, Sep. 15, 1978, 36968/78

Int. Cl.³ G06M *7/06*

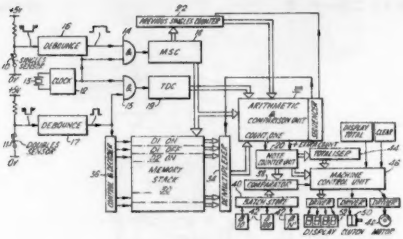
U.S. Cl. 235—92 SB **10 Claims**

1. A method of counting sheets of given length and of a given thickness in a succession of spaced single sheets and

overlapping sheet combinations passing along a flow-line, comprising the steps of:

sensing the beginning and end of a sheet, or combination of overlapping sheets, travelling along the flow-line to ascertain a sensed length therefor;

detecting any increased thickness in the sensed sheet or sheet combination and storing the positions of the beginning and end of such increased thickness in relation to the sensed length of the sheet or sheet combination under evaluation;



automatically testing to ascertain whether a detected increased thickness is substantially symmetrically placed about the mid-point of the sensed length in the direction of the flow-line and has a length not substantially less than the amount by which two sheets of the given sheet length would have to overlap to have a total length equal to the said sensed length;

and adding two to the count of sheets if the result of the said test is positive.

4,255,652

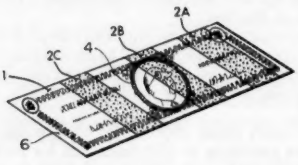
HIGH SPEED ELECTRICALLY RESPONSIVE INDICIA DETECTING APPARATUS AND METHOD

Harold J. Weber, Sherborn, Mass., assignor to Coulter Systems Corporation, Bedford, Mass.

Filed Jan. 31, 1979, Ser. No. 8,058

Int. Cl.[3] **G06K** *7/08;* **G07F** *1/06;* **B07C** *5/00;* **G06K** *19/06*

U.S. Cl. 235—451 **19 Claims**



1. In combination with a controlled document which comprises a substrate member of a predetermined conductivity having at least one detection indicia element applied thereto, said element being of a substance which when so applied has a conductivity that is substantially greater than that of the substrate member, the element having a geometry which has a predetermined quantitative relationship to the character of the controlled document,

apparatus for detecting the element as the document is transported through the apparatus which comprises:

A. a charging station including a charging electrode, a ground plane and d.c. power supply means for establishing an electric field between the ground plane and the charging electrode,

B. a sensor station including sensor electrode means for detecting charge and including circuitry coupled therewith for leaking said detected charge to said ground plane and providing a signal output that is proportional to said detected charge,

C. means for transporting the controlled document at high speed through the apparatus while carrying the detection indicia element through the charging and sensor stations of the apparatus while maintaining the said document spaced from the charging and sensor electrodes in a manner which establishes a first capacitive element at the charging station and a second capacitive element at the sensor station,

i. said first capacitive element including at least the charging electrode, a first air space between the charging electrode and the detection indicia element, the detection indicia element and the ground plane, the detection indicia element being spaced from the ground plane when located in said charging station,

ii. said second capacitive element including at least the sensor electrode, a second air space between the sensor electrode and the detection indicia element, the detection indicia element and the ground plane, the detection indicia element being spaced from the ground plane when located in said sensor station,

D. the movement in the charging station causing charge to be capacitively induced upon the detection indicia element and in the sensor station to cause charge to be capacitively induced upon the sensor electrode, the duration of the charge in each case being related to geometry of the indicia element,

E. and means coupled to the circuitry and responsive to the said signal output thereof to perform a function that is related to the character of the document.

4,255,653

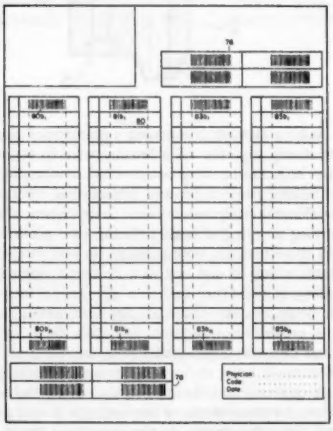
OVERLAY DATA ENTRY DEVICE FOR AUTOMATED DATA SYSTEMS

Franklin R. Borkat, La Mesa, and Richard W. Kataoka, San Diego, both of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jan. 28, 1980, Ser. No. 115,631

Int. Cl.[3] **G06K** *21/06;* **G09B** *23/28;* **G06K** *19/00*

U.S. Cl. 235—495 **12 Claims**



1. An overlay data entry system for automated data systems comprising:

at least two sheets of material each having a distinct set of data entries thereon for selection therefrom by the addition of a marking adjacent to the selected data entries of said sets of data entries, each of said at least two sheets of material having identical means thereon for alignment of a

transparent overlay therewith, each said sheet of material having a distinct blackened area thereon different from said blackened area on every other said sheet of material; and

a transparent overlay having first means thereon for alignment with said alignment means, said transparent overlay further having a first set of indicia thereon forming a first set of numbers, said first set of indicia being so disposed that when said transparent overlay is aligned with one of said at least two sheets of material, each member of said first set of indicia lies adjacent to one member of said set of data entries, said transparent overlay further having a second set of indicia forming a second set of numbers disposed such that when said transparent overlay is aligned over one of said at least two sheets of material, said distinct blackened area obscures some of the members of said second set of indicia.

4,255,654

METHOD OF ELECTRICALLY DETECTING FOCAL POINT OF CAMERAS OR THE LIKE OPTICAL DEVICES

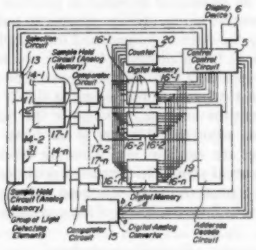
Takeomi Suzuki, Tokyo; Kenichi Oinoue, Sagamihara; Masahiro Aoki, Fussa; Hideyuki Kenjyo, Koganei, and Masatoshi Ida, Hachioji, all of Japan, assignors to IOlympus Optical Co., Ltd., Tokyo, Japan

Filed Jun. 26, 1979, Ser. No. 52,222

Claims priority, application Japan, Oct. 16, 1978, 53/127190

Int. Cl.³ G01J *1/36*

U.S. Cl. 250—204 **1 Claim**



1. A method of electrically detecting a focal point of cameras or the like optical devices, which makes use of a picture image signal treating circuit comprising a number of light detecting elements, a plurality of analog memories for memorizing output signals from said light detecting elements, a digital-analog converter for converting digital signals delivered from a central control circuit to analog signals, a counter driven by the digital signal delivered from said central control circuit, a plurality of comparator circuits for comparing the output signal delivered from said digital-analog converter and serving as a reference signal with the analog signal memorized in said analog memories, and a plurality of digital memories for memorizing the output digital signals from said central control circuit or the output digital signals from said counter and receiving the output signal from said comparator circuit as a write enable signal, said central control circuit controlling said light detecting elements, analog memories, analog-digital converter, counter, comparator circuits and digital memories and deriving by calculation an estimation value which is a total sum of contrast values and which can detect a focal point of said optical device from the digital signals stored in said digital memories, and which comprises the successive steps of changing said reference signal in succession by means of said central control circuit so as to search all of the analog signals stored in said analog memories by said reference signal and detect a mimimum value of said analog signals, making said minimum value thus detected correspondent with a digital amount of 0 and at the same time making a largest possible value of the analog amount of said analog memories correspondent with a suitably selected positive digital amount, searching all of said analog memories again so as to introduce said digital amounts corresponding to respective analog amounts into said digital memories corresponding to said respective analog memories, and introducing the digital amount stored in said digital memories into a given estimation function so as to detect a focal point of said optical device.

4,255,655

TEMPERATURE SENSING SWITCH WITH AN OPTICAL SENSOR

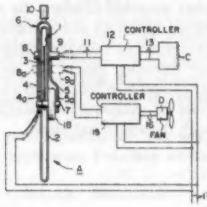
Kikuo Kikuchi, 3-16-2, Kasukabe-higashi, Kasukabe-shi, Saitama-ken, Japan

Filed May 14, 1979, Ser. No. 38,798

Claims priority, application Japan, Dec. 13, 1978, 53-172014[U]

Int. Cl.³ G01D *5/34*

U.S. Cl. 250—231 R **2 Claims**



1. A temperature sensing switch which displays a temperature indication, comprising

a translucent case,

an opaque needle inside the case,

a shaft rotatably supported on said case, said needle being secured to said shaft for rotation therewith,

a thermosensitive means operatively connected to said case and to said shaft for rotating said shaft and needle in response to temperature increases and decreases thereby to provide a temperature indication,

at least one needle position detector disposed on the outside of the case and having first and second integral arms each having first ends which are pivotally supported on said shaft on opposite sides of the case and second ends which are connected together at a position radially externally of the case, said arms being manually pivotable with respect to the case to a selected one of a plurality of desired pivotal positions corresponding to respective temperature indications by said needle, a light source mounted to the first arm, a light sensor mounted to the second arm opposing the light source and adapted to receive light emitted therefrom and transmitted through the case so as to generate an electric signal,

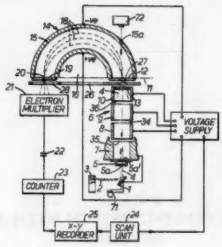
said needle being rotatable in response to a temperature change to a position between said first and second arms thereby interrupting said light between said light source and light sensor and the electric signal associated therewith.

4,255,656

APPARATUS FOR CHARGED PARTICLE SPECTROSCOPY

Andrew Barrie, and Quentin C. Herd, both of Sale, England, assignors to Kratos Limited, England

Filed May 25, 1979, Ser. No. 42,439
Claims priority, application United Kingdom, May 25, 1978, 22583/78
Int. Cl.[3] H01J 39/00
U.S. Cl. 250—305 4 Claims



1. Apparatus for charged-particle spectroscopy for chemical analysis of a sample comprising

a laser or light directing means for irradiating a selected restricted area of a sample so as to release charged particles from the selected area by photon excitation, and to visibly identify the irradiated area of the sample,

an apertured plate mounted adjacent the sample to receive charged particles therefrom and to transmit a pencil beam of said particles received from the selected restricted area,

charged particle focusing means for forming a charged particle image of said selected area in an image plane, and

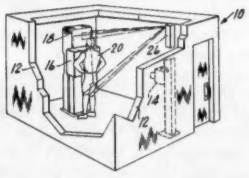
an energy analyser for analysing the energies of the particles passing through the apertured plate.

4,255,657

DIVERGING PLANE POSITIONING DEVICE

Charles Lescrenier, 660 Crescent Ct., Wautatosa, Wis. 53213

Filed Jun. 5, 1979, Ser. No. 45,636
Int. Cl.[3] G03B 41/16
U.S. Cl. 250—322 11 Claims



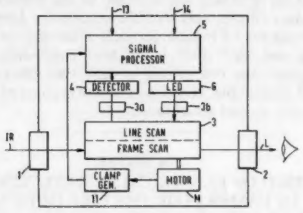
1. A device for positioning the spinal column of a patient located in front of an X-ray film sheet with respect to exposure control means located behind the film sheet, said device comprising a light source having means for generating a first plane of light appliable to the front of the film sheet and the spinal column of the contiguous patient and which bears a known relationship to the exposure control means, said light source further having means for generating a pair of additional light planes diverging in a direction towards the film sheet with respect to the first plane of light.

4,255,658

IMAGE FORMING APPARATUS

Ivan R. Hurst, Frimley, England, assignor to EMI Limited, Hayes, England

Filed Feb. 5, 1979, Ser. No. 9,355
Claims priority, application United Kingdom, Feb. 14, 1978, 5792/78
Int. Cl.[3] H01J 31/49
U.S. Cl. 250—332 7 Claims



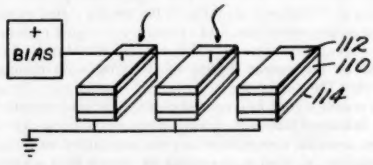
1. An image forming apparatus including a plurality of detectors responsive to thermal radiation from a scene to produce respective electrical signals; a plurality of light emissive diode devices; a plurality of channels coupling the detectors to the light emissive diode devices, each channel including a comparator arranged to compare a repetitive sampling signal, having a waveform in the form of a ramp, with the electrical signal produced by its associated detector to produce for its associated light emissive diode device electrical pulses of widths determined by the electrical signal and the sampling signal, the emissive devices being responsive to the electrical pulses to provide corresponding light pulses; a generator common to all the channels for producing the sampling signal, the generator including means for varying the slope of the ramp and means for applying an adjustable d.c. bias to the ramp whereby contrast and offset are variable; and scanning means arranged to cause the electrical signals to represent portions of the object according to a predetermined scanning pattern and to cause the light pulses to form an image of the scene according to that pattern.

4,255,659

SEMICONDUCTOR RADIATION DETECTOR

Leon Kaufman, San Francisco, and Kenneth E. Hosier, Jr., Martinez, both of Calif., assignors to The Regents of the University of California, Berkeley, Calif.

Filed Mar. 27, 1978, Ser. No. 890,841
Int. Cl.[2] G01T 1/22
U.S. Cl. 250—370 59 Claims



1. A radiation detecting apparatus for use in detecting incident radiation pulses of predetermined duration, said detector comprising:

a semiconductor detector which generates electrical charge in response to incident radiation, said detector being disposed to receive at least a portion of said radiation pulses;

signal processing means, AC coupled electrically to said semiconductor detector for generating an output electrical signal accurately representing said incident radiation, said signal processing means including filter means for al-

lowing only frequency components within a predetermined range of frequencies to contribute to said output electrical signal, said range of frequencies being determined in accordance with the duration of said incident radiation pulses so that said output electrical signal is undistorted by variations in internal electrical characteristics of the semiconductor detector.

4,255,660
DETECTORS OF PENETRATING RADIATION

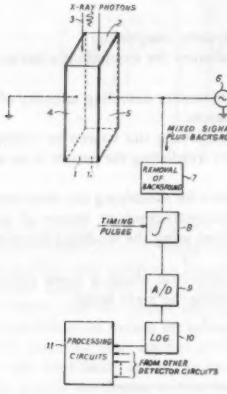
Stephen J. Blundell, Hayes, and Charles W. Turner, Virginia Water, England, assignors to EMI Limited, England

Filed Aug. 4, 1978, Ser. No. 931,253

Claims priority, application United Kingdom, Aug. 5, 1977, 32877/77

Int. Cl.³ G01T *1/22*

U.S. Cl. 250—370 **27 Claims**



1. A detector, of penetrating radiation, including photoconductive material arranged to receive the radiation, means for applying to the material two electrical signals at respective frequencies, means for deriving from the material an output electrical signal at a frequency different from said respective frequencies, which results from interrelation of the two applied signals, and which comprises a signal component which is a function of the intensity of incident radiation and a background component which is substantially independent of that intensity.

4,255,661
ELECTROSTATIC EMISSION LENS

Helmut Liebl, Eching, Fed. Rep. of Germany, assignor to Max-Planck-Gesellschaft zur Forderung der Wissenschaften e.V., Goettingen, Fed. Rep. of Germany

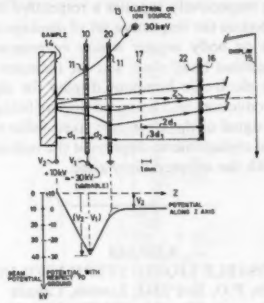
Filed Jul. 24, 1979, Ser. No. 60,046

Claims priority, application Fed. Rep. of Germany, Sep. 29, 1978, 2842527

Int. Cl.³ G21K *1/08*; G21N *23/00*; H01J *39/00*

U.S. Cl. 250—396 R **10 Claims**

1. An electrostatic emission lens arrangement for producing a microparticle image of a surface by means of charged particles emitted from said surface and accelerated to a predetermined final energy level, and comprising a first and a second apertured diaphragm electrode means arranged in spaced relationship with respect to each other and to said emitting surface, a voltage biasing source for producing a predetermined potential difference between said surface and the adjacently placed first apertured diaphragm electrode means, and a predetermined potential difference between said first apertured diaphragm electrode means and the second apertured diaphragm electrode means, said emitting surface (**14**) and the first apertured diaphragm electrode means (**10**) being spaced at a first distance (d_1) and the first and second apertured diaphragm electrode means (**10, 20**) being spaced at a second distance (d_2), and said spacing of said electrode means and the relationship between the potentials (V_1, V_2) of said surface (**14**) and of said first electrode means (**10**) being so dimensioned that the



charged particles are accelerated between said surface (**14**) and said first apertured diaphragm electrode means (**10**) to a multiple of the desired final energy level, and that the particles are retarded to the desired final energy level when passing between said first (**10**) and second (**20**) apertured diaphragm electrodes means.

4,255,662
X-RAY DIAGNOSTIC APPARATUS HAVING OPERATING KEYS FOR THE ORGANWISE PROGRAMMED SETTING OF EXPOSURE DATA

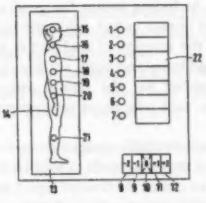
Amandus Waterkamp, Bonn, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Dec. 11, 1978, Ser. No. 968,219

Claims priority, application Fed. Rep. of Germany, Dec. 14, 1977, 2755736

Int. Cl.³ H05G *1/30*

U.S. Cl. 250—416 R **5 Claims**



1. An x-ray diagnostic apparatus having operating keys for the organwise programmed setting of the exposure data, having an indicator field respectively assigned to each operating key for indicating respective body portions or body organs, and having an indicator board associated with the operating keys and including a representation of the body zones of a human body, and also means comprising a selective switching device for selecting a respective one of a specific number of body zones and for assigning a set of body portions or body organs for indication on the indicator fields according to the selected body zone, the selective switching device and the operating keys cooperating to determine the exposure data in conformity with the selected specific body part or body organ of the set corresponding to the selected specific body zone, and indicator means controlled by the selective switching device for producing at the indicator fields assigned to the respective operating keys a set of displays representing the respective body parts or body organs of the set corresponding to the

selected body zone, characterized in that an electronic fixed value store (**26**) is present for controlling the indicator means (**22**), said store having a specific number of store locations corresponding to each setting of the selective switching device (**15** through **21**), said fixed value store being responsive to the setting of the selective switching device (**15** through **21**) such that said store respectively supplies a respective output signal which characterizes the respective set of displays representing body portions or body organs which correspond with the respectively selected body zone, and the indicator means (**22**) comprising an electronic luminous display for alphanumeric character reproduction, said luminous display being controlled by the output signal of the electronic fixed value store (**26**) to provide a set of alphanumeric displays at the indicator fields in accordance with the selected body zone.

4,255,663

DISPOSABLE LIQUID STERILIZER UNIT

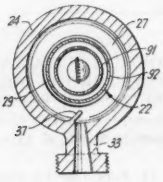
James H. Lewis, P.O. Box 2341, London, Canada

Continuation-in-part of Ser. No. 781,021, Mar. 24, 1977, Pat. No. 4,141,686. This application Jan. 8, 1979, Ser. No. 1,580

The portion of the term of this patent subsequent to Feb. 27, 1996, has been disclaimed.

Int. Cl.[3] **A61L** *2/10, 2/26*

U.S. Cl. 250—436 **5 Claims**



1. A disposable unit for sterilizing a liquid comprising:

an elongated jacket having an inner surface and opposing ends,

an elongated tube including means for generating radiation to sterilize liquid in said jacket, said tube extending longitudinally along the interior of said jacket and having an outer surface, said inner and outer surfaces together defining a flow chamber for the liquid within said jacket around said tube, said tube being nonremovably received by said jacket,

said jacket being substantially opaque to said radiation,

means adjacent said opposing ends of said jacket for providing an inlet and an outlet for flow of liquid into said chamber and into direct contact with said outer surface of said tube for sterilization by the radiation therefrom and finally out of said outlet, and

liquid tight seals at the ends of said jacket engaging respective ends of said tube to prevent outflow of liquid from the flow chamber except via said outlet,

said tube ends each terminating in electrically conductive terminal means extending exteriorly of said jacket ends for applying electrical power to said tube and for providing mechanical support to said unit,

said tube being a doublewalled tube having inner and outer cylindrical walls sealed together and spaced apart from each other, said outer surface of said tube being the outer surface of said outer wall and said means for generating radiation being located within said inner wall whereby the sealed space between said walls serves to provide thermal insulation between said generating means and the liquid in the flow chamber.

4,255,664

SPLIT FILTER CT

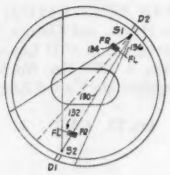
Brian K. Rutt, and Aaron Fenster, both of Toronto, Canada, assignors to Picker Corporation, Cleveland, Ohio

Filed Jun. 8, 1979, Ser. No. 46,609

Claims priority, application Canada, Mar. 23, 1979, 324189

Int. Cl.[3] **A61B** *6/00*

U.S. Cl. 250—445 T **17 Claims**



1. A tomographic system comprising:

(a) a source of x-radiation for irradiating a patient with an x-ray beam;

(b) a plurality of detectors for detecting intensity of radiation emitted by the source;

(c) drive means for moving the source in relation to the patient and thereby irradiating the patient from a plurality of orientations;

(d) imaging electronics for modifying the detected intensity values and for reconstructing an image of an interior portion of the patient using the modified intensity values; and,

(e) filter means, asymmetric about a beam centerline for selectively attenuating the x-ray beam.

4,255,665

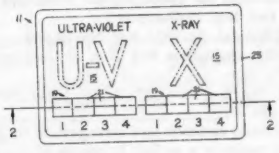
WEARABLE DEVICE FOR MONITORING MOMENTARY PRESENCE OF INTENSE X-RAY AND/OR ULTRA-VIOLET RADIATIONS

Walter Shriner, 1409 Stevenson Dr., Springfield, Ill. 62703

Continuation-in-part of Ser. No. 962,244, Nov. 20, 1978, abandoned. This application Jan. 28, 1980, Ser. No. 115,604

Int. Cl.[3] **G01J** *1/58*

U.S. Cl. 250—483 **14 Claims**



11. A device for warning persons of the momentary presence of dangerous intensities of certain radiant energies, comprising: a base lamina; material, fluorescent to at least one distinct range of potentially dangerous radiant energy, positioned over said base lamina so as to define a message in printed form thereon; and at least one lamina, transparent to said at least one distinct range of radiant energy and to the visible light to be emitted by said fluorescent material, protectively covering at least the message surface of said base lamina.

4,255,666

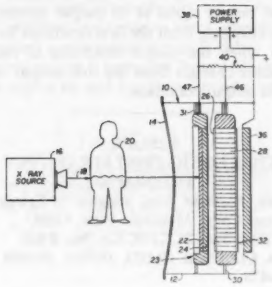
TWO STAGE, PANEL TYPE X-RAY IMAGE INTENSIFIER TUBE

Shih-Ping Wang, Los Altos, and Charles D. Robbins, Los Altos Hills, both of Calif., assignors to Diagnostic Information, Inc., Sunnyvale, Calif.

Continuation-in-part of Ser. No. 885,169, Mar. 10, 1978. This application Mar. 7, 1979, Ser. No. 18,127

Int. Cl.³ H01J *31/50*; G01T *1/00, 1/20*

U.S. Cl. 250—486 **12 Claims**



1. An x-ray sensitive image intensifier tube characterized by a flat scintillator screen for converting impinging x-rays into a corresponding light spot pattern, a flat output display screen, and multi-stage light amplification means intermediate the scintillator screen and the output display screen, the multi-stage light amplification means including at least a first flat photocathode disposed with its flat surfaces parallel to and adjacent to the scintillator screen, an intermediate flat phosphor display screen, the display screen having its flat surfaces parallel to and spaced apart from the flat surfaces of the first photocathode and on its side opposite from the scintillator screen, a fiberoptic plate, a second photocathode, the first and second photocathodes producing a pattern of photoelectrons corresponding to the light spot pattern, and wherein the intermediate display screen is mounted on one side of the fiberoptic plate and the second photocathode is mounted on the other side of the fiberoptic plate, the output display screen being spaced apart from the second photocathode and plane parallel to it,

an output window on which the output display screen is mounted,

a metallic input window,

means for applying an accelerating electrostatic potential between the intermediate display screen and the first photocathode and for applying an accelerating electrostatic potential between the second photocathode and the output display screen,

an open ended, hollow, evacuated envelope surrounding the scintillator screen, the fiberoptic plate, the first and second photocathodes, the intermediate and output display screens and which is closed at one end by the output window and at the other end by the input window and

wherein the scintillator screen, the first and second photocathodes and the first and second display screens all have diagonal dimensions at least equal to the actual size of the x-ray image to be intensified, and means for applying separate electrostatic potentials solely between the first and second display screens on the one hand and the first and second photocathodes on the other hand to accelerate the photoelectrons produced at the photocathodes toward the display screens along essentially parallel, straight trajectories to impinge upon the display screen.

4,255,667

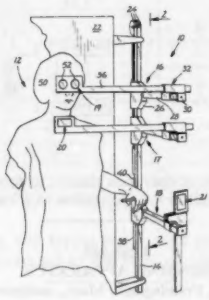
X-RAY SHIELD STAND

Leonard E. Bolin, 1460 E. Ave. N.E., Salem, Oreg. 97301, and Randy L. Marcus, 214 S. 19th St., Springfield, Oreg. 97477

Filed Jun. 1, 1979, Ser. No. 44,594

Int. Cl.³ G21C *11/00*; G21F *1/00*

U.S. Cl. 250—515 **3 Claims**



1. Apparatus for shielding selected body areas of a person undergoing, in an elongate, upright examination zone, irradiation by X-rays directed into the zone in a generally front-to-back direction, said apparatus, in operative condition relative to said zone, comprising

an upright post extending along a substantial portion of the zone,

a plurality of shield assemblies mounted on said post for shifting relative thereto, each of said assemblies including,

a bracket slidably mounted on said post for placement in different selected positions therealong corresponding to the height in said zone of one such body area,

counterweight means shiftably mounted on said post and connected to said bracket to counterbalance the weight of the associated assembly at different positions along said post,

an arm-mounting structure having an elongate slot,

means mounting said structure on said bracket for placement in different selected positions along such direction, with the axis of said slot oriented horizontally and substantially perpendicular to said direction,

a shield arm slidably carried in said slot for movement with respect to said structure along said axis, and

an X-ray shield mounted on said arm.

4,255,668

PULSED POWER SUPPLIES

Colin G. Harrison, High Wycombe, England, assignor to EMI Limited, Hayes, England

Filed Mar. 20, 1979, Ser. No. 22,168

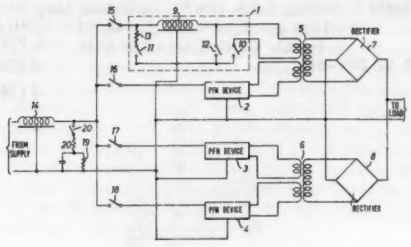
Claims priority, application United Kingdom, Mar. 30, 1978, 12532/78

Int. Cl.³ H03K *3/55*

U.S. Cl. 307—107 **6 Claims**

1. A pulsed power supply comprising at least four pulse forming network (or delay line) devices coupled in pairs to respective transformers and switchable means for controlling said devices so that the individual devices supply pulses of relatively short duration to their respective transformers, the pulses supplied by the devices of one of said pairs being interleaved in time with the pulses supplied by the devices of the other pair and the devices of a pair supplying pulses alterna-

tively to the respective transformer, and means for combining the energy supplied to said transformer by all of said devices



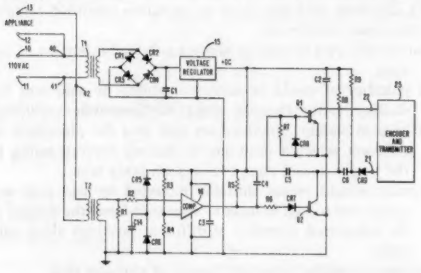
during many cycles of operation thereof to produce a pulse of relatively long duration for application to a load.

4,255,669

SENSING APPARATUS

Richard L. Naugle, Framingham, Mass., assignor to GTE Laboratories Incorporated, Waltham, Mass.

Filed Sep. 17, 1979, Ser. No. 75,782
Int. Cl.³ G08B *21/00*
U.S. Cl. 307—131 **8 Claims**



1. Sensing apparatus for monitoring the operation of an electrical appliance including in combination

transformer means having a primary winding and a secondary winding;

means for connecting the primary winding of the transformer means in the current path of an electrical appliance to be monitored;

detection circuit means coupled to the secondary winding of the transformer means, the detection circuit means being operable to produce a first output condition when the current flow through the primary winding of the transformer means is less than a predetermined amount and to produce a second output condition when the current flow through the primary winding of the transformer means is greater than said predetermined amount;

first transistor circuit means coupled to said detection circuit means and having an output connection, said first transistor circuit means being operable in a first condition when the detection circuit means is producing a first output condition and in a second conditiion when the detection circuit means is producing a second output condition; and

second transistor circuit means coupled to said first transistor circuit means and having an output connection, said second transistor circuit means being operable to produce an output signal at its output connection in response to the first transistor circuit means changing from said first condition to said second condition when the output condition of the detection circuit means changes from the first output condition to the second output condition, and said second transistor circuit means producing no output signal at its output connection in response to the first transistor circuit means changing from said second condition to said first condition when the output condition of the detection circuit means changes from the second output condition to the first output condition;

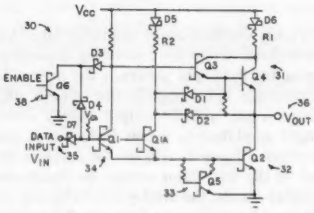
said first transistor circuit means being operable to produce an output signal at its output connection in response to changing from the second condition to the first condition when the output condition of the detection circuit means changes from the second output condition to the first output condition, said first transistor circuit means producing no output signal at its output connection in response to changing from the first condition to the second condition when the output condition of the detection circuit means changes from the first output condition to the second output condition.

4,255,670

TRANSISTOR LOGIC TRISTATE OUTPUT WITH FEEDBACK

Paul J. Griffith, Portland, Me., assignor to Fairchild Camera and Instrument Corp., Mountain View, Calif.

Filed Jan. 24, 1979, Ser. No. 5,928
Int. Cl.³ H03K *19/013, 19/084, 19/088*
U.S. Cl. 307—473 **12 Claims**



1. In a transistor logic tristate output device of the type comprising an input and an output for binary data signals of high and low potential, pullup element for sourcing current to the output and output load from high potential, pulldown element for sinking current from the output and output load to low potential, phase splitter element coupled at the input to control the pullup and pulldown elements, and an enable gate for sinking current from the elements of the device to afford a high impedance third state at the output when the enable gate is activated, the improvement comprising:

means for feedback of a portion of current from any output load to drive the pulldown element and accelerate sinking of current from the output during transition at the output from high to low potential, said means also blocking paths from output to ground through the enable gate when the output is in the high impedance third state, said means for feedback coupled in parallel configuration with the phase splitter element.

4,255,671

IIL TYPE SEMICONDUCTOR INTEGRATED CIRCUIT

Terumoto Nonaka; Takashi Yoshida, and Takeshi Matsuyama, all of Hamamatsu, Japan, assignors to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan

Filed Jul. 26, 1977, Ser. No. 819,405
Claims priority, application Japan, Jul. 31, 1976, 51/90860
Int. Cl.³ H01L *27/04;* H03K *19/091*
U.S. Cl. 307—446 **6 Claims**

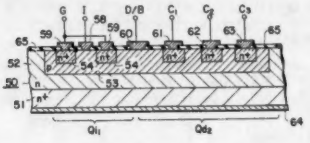
1. A semiconductor integrated circuit device formed in a common semiconductor wafer having a pair of principal surfaces, comprising:

a first semiconductor region of a first conductivity type disposed adjacent to one of said principal surfaces,

a second semiconductor region of a second conductivity type opposite to said first conductivity type disposed adjacent to said first semiconductor region between said first semiconductor region and the other of said principal surfaces, said first and second semiconductor regions forming a PN junction therebetween,

a third semiconductor region of said first conductivity type disposed in said second semiconductor region and adjacent to said other principal surface,

a fourth and a fifth semiconductor region of said second conductivity type disposed adjacent to each other, said fourth semiconductor region being disposed adjacent to said second semiconductor region, while the fifth semiconductor region is separated from said second semiconductor region by said fourth semiconductor region,



a sixth semiconductor region of said first conductivity type disposed adjacent to said fourth semiconductor region,

a seventh semiconductor region of said first semiconductor type disposed adjacent to said fourth semiconductor region, and electrically connected to said sixth semiconductor region, said sixth and seventh regions substantially surrounding said fourth semiconductor region and at least part of said fifth semiconductor region, thereby forming a vertically oriented current path in said fourth semiconductor region,

an injection electrode formed on said fifth semiconductor region and electrically isolated from sixth semiconductor region, and

means for applying a biasing potential between said injection electrode and said first semiconductor region of such polarity as to forward bias the PN junction between said first and second semiconductor regions.

4,255,672

LARGE SCALE SEMICONDUCTOR INTEGRATED CIRCUIT DEVICE

Kenichi Ohno, Tokyo; Tohru Hosomizu; Rokutaro Ogawa, both of Yokohama, and Mitsuhisa Shimizu, Kawasaki, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Dec. 28, 1978, Ser. No. 973,908

Claims priority, application Japan, Dec. 30, 1977, 52-158444

Int. Cl.[3] **H01L** *27/04;* **H03K** *19/086*

U.S. Cl. 307—455 **8 Claims**

1. An LSI chip comprising:

a semiconductor substrate having a planar surface;

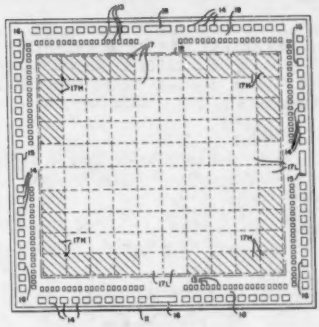
transistors and resistors formed with selected patterns in said surface;

metallic layers formed on said substrate comprising systems for connecting said transistors and resistors and for distributing supply and ground potentials;

macros comprising logic circuits, said macros being disposed in at least one array on said surface, and said logic circuits selectively comprising said transistors, resistors and metallic layers;

input/output terminal pads provided on said surface near the periphery of said macro array(s), said input/output pads comprising terminal pads for said supply and ground potentials;

said resistors forming said logic circuits being selected for compensating voltage variations along said metallic layers



comprising said supply and ground potential distribution systems connected to said logic circuits.

4,255,673

INPUT CHARGE CORRECTED MONOLITHICALLY INTEGRATED CHARGE TRANSFER DEVICE (CTD) ARRARGEMENT

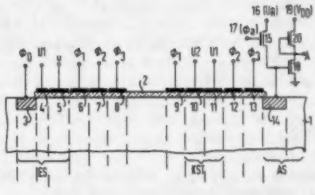
Karl Knauer, Kirchseeon, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Aug. 6, 1979, Ser. No. 63,929

Claims priority, application Fed. Rep. of Germany, Aug. 31, 1978, 2838037

Int. Cl.[3] **G11C** *19/28;* **H01L** *29/78;* **H03H** *15/02*

U.S. Cl. 307—221 D **5 Claims**



1. A monolithically integrated CTD arrangement, comprising a semiconductor layer formed with a first conductivity type of doping, first and second spaced apart zones formed in said doped semiconductor layer with a second conductivity type of doping, and input stage which comprises said first zone and a first input gate electrode and a second input gate electrode, each of said gate electrodes being arranged in an insulated fashion above said semiconductor layer, one of said input gate electrodes being fed with an analog input signal, the other of said input gate electrodes being fed with a constant d.c. voltage, and said zone being fed with a pulse train voltage, a series of transfer electrodes arranged in an insulated fashion above said semiconductor layer and an output stage which includes said second zone, the constant d.c. voltage differing from one of the extreme values of the input signal by an amount which corresponds to a basic charge which is to be input, a compensation stage being provided which is located within said series of transfer electrodes and which possesses two compensation gate electrodes which are arranged in insulated fashion above said semiconductor layer, one of which said compensation electrodes being fed with a compensation d.c. voltage which is dependent upon the analog input signal and the other of which is fed with the said constant d.c. voltage, one of said transfer electrodes being arranged adjacent

said second zone, and said second zone is provided with a drain terminal.

4,255,674

SEMICONDUCTOR DEVICE HAVING A MULTIPLE-EMITTER TRANSISTOR

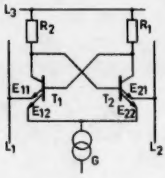
Didier J. R. Grenier, and Jean M. H. Seguin, both of Caen, France, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jan. 2, 1979, Ser. No. 415

Claims priority, application France, Dec. 30, 1977, 77 39795

Int. Cl.³ H01L *27/10*; G11C *11/40*

U.S. Cl. 365—155 **9 Claims**



1. A semiconductor device having a semiconductor body comprising a surface-adjoining island-shaped region in which a transistor is provided having a collector region of a first conductivity type, a base region of a second conductivity type opposite to that of the first and at least two emitter regions of the first conductivity type in which, viewed on the surface, the base is situated above the collector region, the emitter regions are situated above the base region, and the base region is connected to a resistor formed by a resistive zone of the second conductivity type which is provided in the island-shaped region, adjoins the base region and has two connections, a first of which comprises a base contact, characterized in that the side walls of the island-shaped region are bounded by a dielectric and that a first emitter region is situated between the base contact and the second connection of the resistive zone and the second emitter region is situated on the side of the base contact remote from the second connection, that the base region, at least at the area of the first emitter region, and the first emitter region both extend transvrsely over the width of the island-shaped region and adjoin the dielectric, and that the first emitter region includes an aperture which contains a conductive channel portion of the base region for carrying the current between the base contact and the second connection of the resistive zone, which channel divides the first emitter region into at least two separate sub-regions, each adjoining the dielectric on only one side.

4,255,675

CIRCUIT ARRANGEMENT FOR REDUCING THE RECOVERY TIME OF A THYRISTOR

Erhard Lehmann, Aschheim; Peter Wojtalla, Lohhof, and Peter Voss, Munich, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

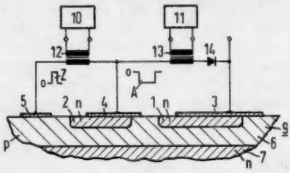
Filed Oct. 19, 1978, Ser. No. 952,673

Claims priority, application Fed. Rep. of Germany, Oct. 27, 1977, 2748316

Int. Cl.³ H03K *17/04, 17/72*

U.S. Cl. 307—252 A **3 Claims**

1. Circuit arrangement for reducing recovery time of a thyristor having a control electrode, a main emitter electrode and at least one auxiliary emitter electrode disposed between the main emitter electrode and the control electrode, comprising two current sources, one of which delivers a pulse of one polarity and is connected to and between the control electrode and the auxiliary emitter electrode, and the other of which delivers a pulse of the other polarity and is connected to and between the auxiliary emitter electrode and the main emitter



electrode, and transformer means through which the current sources are connected to the respective electrodes.

4,255,676

SEMICONDUCTOR PHASE SHIFT DEVICE FOR A CHARGE TRANSFER FILTER

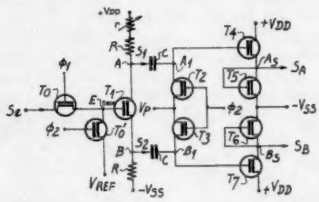
Jean-Luc Berger, and Jean-Louis Coutures, both of Paris, France, assignors to Thomson-CSF, Paris, France

Filed Jan. 9, 1979, Ser. No. 2,094

Claims priority, application France, Jan. 13, 1978, 78 00934

Int. Cl.³ H03K *5/135, 5/15, 5/05*

U.S. Cl. 307—262 **10 Claims**



1. A semi-conductor phase shift device for generating two signals opposite in phase, comprising:

a sampling stage receiving an input signal (S_e) for the device and containing two MOS type transistors which operate in phase opposition, said sampling stage supplying a signal S_{ECH} which, during one of said phases, is identical to the input signal (S_e) and, during the other of said phases, is a constant voltage V_{REF};

a first MOS type transistor which receives signal S_{ECH} on its gate and delivers, at its drain and source respectively, two signals S_1 and S_2 which are opposite in phase and represent in each case signal S_{ECH};

capacitive coupling means, which receive signals S_1 and S_2 and transmit only the non-continuous components;

polarizing means containing MOS type transistors, which supply an adjustable D.C. component to signals S_1 and S_2.

4,255,677

CHARGE PUMP SUBSTRATE BIAS GENERATOR

Lieuwe Boonstra; Cornelis W. Lambrechtse; Roelof H. W. Salters, and Rene M. G. Wijnhoven, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 390,692, Aug. 23, 1973, abandoned.

This application Feb. 24, 1975, Ser. No. 552,294

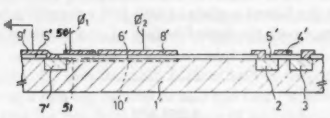
Claims priority, application Netherlands, Sep. 15, 1972, 7212509

Int. Cl.³ H01L *27/04*

U.S. Cl. 307—304 **30 Claims**

19. In a semiconductor charge pumping device including a semiconductor chip having a pair of abutting regions of opposite conductivity type, and gate means for creating an inversion layer comprising minority carriers on at least a portion of the

surface of the first of said regions, the improvement which comprises means for causing said inversion layer to collapse in a first part of said portion before said inversion layer collapses



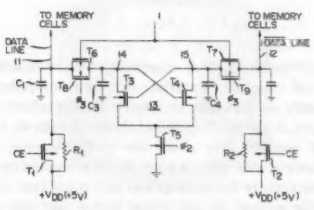
in a second part of said portion, said first part being located between said second part and said second region, and means for allowing said minority carriers to recombine in said first region to provide a net charge therein.

4,255,678

VOLTAGE SENSE CIRCUIT

Yasoji Suzuki, Ayase; Kiyofumi Ochii, Inagi, and Hirozi Asahi, Zama, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Japan

Filed Nov. 20, 1978, Ser. No. 962,221
Claims priority, application Japan, Nov. 21, 1977, 52-139585
Int. Cl.³ H03K 5/24; G11C 7/00
U.S. Cl. 307—355 **3 Claims**



1. A voltage sense circuit for sensing potential differences between first and second signal lines connected to memory cells, each of said signal lines being first precharged to a first supply voltage level during a precharge period and the potential of one of said signal lines thereafter being subject to change by data readout from an accessed memory cell of said memory cells during a readout period after said precharge period to create a potential difference between said signal lines, the voltage sense circuit comprising:

a flip-flop circuit having first and second outputs;

a first parallel connection of a first complementary pair of MOS transistors of first and second channel types connected between said first output of said flip-flop circuit and said first signal line;

a second parallel connection of a second complementary pair of MOS transistors of said first and second channel types connected between said second output of said flip-flop circuit and said second signal line;

a flip-flop enable MOS transistor connected to said flip-flop circuit for actuating said flop-flop circuit;

means supplying a timing signal varying between said first supply voltage and a second supply voltage level to said MOS transistors of each of said first and second channel types of said first and second parallel connections and supplying an actuation signal to said enable MOS transistor for:

(i) holding said MOS transistors of said first channel type in an ON state to precharge said first and second outputs of said flip-flop circuit to said first supply voltage level during said precharge period, and for turning OFF said MOS transistors of said first channel type after said data readout period,

(ii) enabling said flip-flop MOS transistor after said readout period to actuate said flip-flop circuit and thereby achieve at one of said first and second outputs said second supply voltage level in response to potentials at said first and second outputs after said potential difference occurs between said first and second signal lines, and

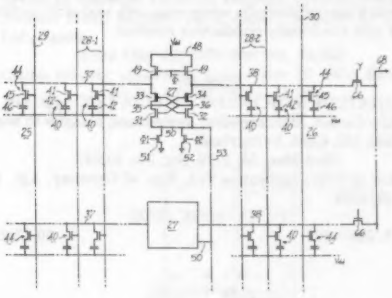
(iii) holding the one of said MOS transistors of said second channel type which is coupled to the one of said first and second outputs of said flip-flop circuit that is at said second voltage supply level upon actuation of said flip-flop circuit in an ON state to discharge said signal line that is connected to said one of said MOS transistors of said second channel type.

4,255,679

DEPLETION LOAD DYNAMIC SENSE AMPLIFIER FOR MOS RANDOM ACCESS MEMORY

Lionel S. White, Jr., Houston, Tex., and James C. Blankenhorn, Phoenix, Ariz., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Oct. 30, 1978, Ser. No. 955,675
Int. Cl.³ H03K 5/24; G11C 7/06
U.S. Cl. 307—355 **10 Claims**



1. In a memory system of the type having array of rows and columns of memory cells, a sense amplifier positioned at the center of each column line, each sense amplifier including a pair of cross-coupled driver transistors and a coupling transistor in series with each driver transistor between the driver transistor and the column line, and a precharge device connected to each half of each column line, each precharge device functioning to precharge the column line to approximately a supply voltage level, the improvement wherein each of said coupling transistors is of the depletion mode type.

4,255,680

LINEAR INDUCTION MOTOR

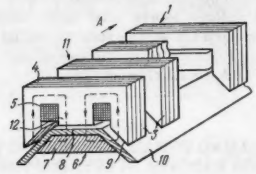
Alexandr D. Popov, pereulok Rynochny, 44; Vladimir A. Solomin, ulitsa Dachnaya, 14, kv. 31, both of Rostov-na-Donu, and Vladimir A. Trofimov, selo Kalakleya, pereulok Tikhy, 8, Cherkasskaya oblast, all of U.S.S.R.

Filed Dec. 19, 1978, Ser. No. 970,990
Int. Cl.³ H02K 41/02
U.S. Cl. 310—13 **2 Claims**

1. In a linear induction motor for generating thrust in a longitudinal direction comprising an inductor including a plurality of cores spaced from each other in the longitudinal direction, each of said cores comprising at least two transversely spaced, laterally extending legs having butt ends defining internal facing sides and external sides, and a transversely extending yoke interconnecting said at least two legs, a plurality of concentrated polyphase windings, each of said windings being arranged on a respective one of said cores, a longitudinally extending secondary element located in opposed relationship with the butt ends of said core legs, said secondary ele-

ment including a first longitudinally extending electrically conductive member and a longitudinally extending magnetically conductive base on which said electrically conductive member is situated for closing the magnetic flux in the transverse direction, the improvement comprising:

the internal sides of said butt ends of said core legs being formed with main chamfers;



said first longitudinally extending electrically conductive member having main wall portions extending at an angle with respect to each other, respective ones of said wall portions extending substantially parallel to the chamfered internal sides of said core leg butt ends; and

said magnetically conductive base having surface portions which are substantially congruent with said wall portions of said electrically conductive member.

4,255,681

MINIATURE SYNCHRONOUS ELECTRIC MOTOR

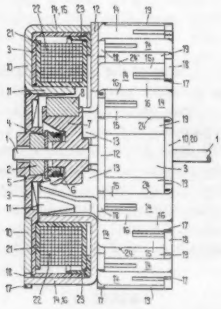
Hermann Gerber, Münchenwiler, Switzerland, assignor to Sodeco-Saia AG, Genf, Switzerland

Filed Mar. 26, 1979, Ser. No. 23,947

Claims priority, application Fed. Rep. of Germany, Apr. 13, 1978, 2816098

Int. Cl.³ H02K *19/00*

U.S. Cl. 310—162 **10 Claims**



1. A miniature electric motor, more especially a synchronous motor, comprising:

a first stator half and a substantially identically shaped second stator half, said stator halves having a common center axis;

each said stator half having pole teeth bent inwardly parallel to said axis wherein said pole teeth of said first stator half interpose said pole teeth of said second stator half in a circumferentially spaced relationship about said axis;

a rotor positioned along said axis inside said pole teeth;

a coil positioned radial to said axis outside said pole teeth;

each said stator half further having connecting lugs bent inwardly parallel to said axis along a circumference thereof and outside said coil wherein said connecting lugs of said first stator half circumferentially engage said connecting lugs of said second stator half; and

a ring of a plastics material parallel to said stator halves and having circumferential ribs extending parallel to said axis inside said connecting lugs, wherein each pair of connecting lugs, including a first connecting lug from said first stator half and a second connecting lug from said second stator half, is located in a common plane between said ribs with the lateral surface of said first connecting lug in full contact with the lateral surface of said second connecting lug.

4,255,682

MULTIPOLAR RESOLVER

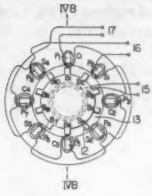
Ryuji Toida; Yuji Sakai, and Mitsuru Ikegami, all of Nagoya, Japan, assignors to Okuma Machinery Works Ltd., Nagoya, Japan

Filed Apr. 30, 1979, Ser. No. 34,974

Claims priority, application Japan, Sep. 25, 1978, 53/118206

Int. Cl.³ H02K *17/42*

U.S. Cl. 310—168 **6 Claims**



1. A multipolar resolver comprising a substantially cylindrical rotor of magnetic material with 5n rotor poles provided equidistantly on the outer periphery thereof where n is a positive integer, a stator of magnetic material with 4n stator poles proveded equidistantly along the circumference concentric with the axis of said rotor, a central coil provided on said stator along substantially the same axis as said rotor axis, and sine and cosine coils wound on said stator poles, said sine and cosine coils being wound alternately on said stator poles, said sine coils being connected in series with each other and wound in opposite directions of winding alternately, and said cosine coils being connected in series with each other and wound in opposite directions of winding alternately.

4,255,683

SALIENT POLE FOR AN ELECTRIC MACHINE

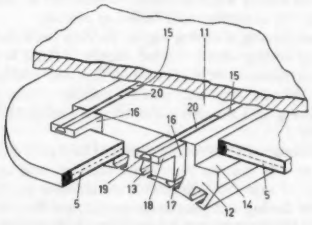
Ernst Krisch, Konstrukteru; Jorg Meister, Weiermattring, and Josef Moser, Wicklereitechniker, all of Switzerland, assignors to BBC Brown Boveri & Company Limited, Baden, Switzerland

Filed Mar. 2, 1978, Ser. No. 882,905

Claims priority, application Switzerland, Mar. 9, 1977, 2923/77

Int. Cl.³ H02K *3/48*

U.S. Cl. 310—214 **3 Claims**



1. A salient pole for an electric machine having a casing, said pole comprising:

a flat coil including a winding comprised of round wire having an adhesive layer;

a pole core having end faces, axially disposed grooves and coil support surfaces;

L-shaped spacers having grooves aligned with the grooves of said pole core and fixed to at least one end face of said pole core by means of bars located in said grooves, and engaged by said flat coil, each of said L-shaped spacers having a first leg parallel to said end face for axially spacing said flat coil from the end face of said pole core and a second leg substantially perpendicular to said end face for radially spacing said flat coil from the machine casing and for radially supporting said flat coil and maintaining the flat coil against the support surface of said pole core.

4,255,684

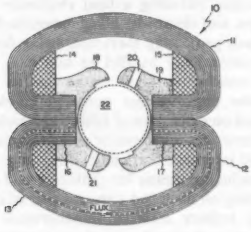
LAMINATED MOTOR STATOR STRUCTURE WITH MOLDED COMPOSITE POLE PIECES

William R. Mischler, Schenectady, N.Y., and General Electric Company, 02, Schenectady, N.Y.

Filed Aug. 3, 1979, Ser. No. 63,129

Int. Cl.³ H02K *1/00, 1/04*

U.S. Cl. 310—216 **5 Claims**



1. A motor stator comprising:

a laminated stator core comprised of substantially identical core sections each constructed of nested layers of flat metallic strip bent to have a pair of straight legs and a connecting yoke member, said core sections being assembled coplanar to one another to be a magnetic structure with an even number of inwardly projecting contacting pairs of straight legs which are the poles;

a concentrated stator coil surrounding every such contacting pair of core straight legs; and

a magnetic composite pole piece molded onto every contacting pair of core straight legs, said composite pole pieces having curved air gap surfaces and holding together the assembly of said core sections and stator coils.

4,255,685

ROTATING ANODE FOR X-RAY TUBES

Rudolf Friedel, Kleinseebach, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

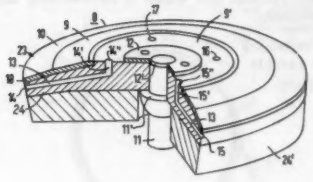
Filed Jul. 3, 1979, Ser. No. 54,410

Claims priority, application Fed. Rep. of Germany, Aug. 1, 1978, 2833751

Int. Cl.³ H01J *35/08*

U.S. Cl. 313—330 **6 Claims**

1. An x-ray tube rotating anode comprising an actual anode plate (23), said actual anode plate (23) comprising a main body member (24) having an upper side carrying an annular focus path region (9, 10) thereon, and having an underside opposite said upper side and integral with said main body member (24), said actual anode plate having radial bores (13) extending radially in said main body member (24) under said annular focus path region (9, 10) and said bores (13) having cross sectional dimensions less than the thickness of the main body member (24) at the outer perimeter thereof, and said bores (13)



being entirely clear of said underside of said main body member (24).

4,255,686

STORAGE TYPE PHOTOSENSOR CONTAINING SILICON AND HYDROGEN

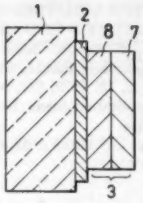
Eiichi Maruyama, Kodaira; Yoshinori Imamura, Hachioji; Saburo Ataka, Hinodamachi; Kiyohisa Inao, Mobara; Yukio Takasaki, Hachioji; Toshihisa Tsukada, TokySekimachi, and Tadaaki Hirai, Koganei, all of Japan, assignors to Hitachi, Ltd., Japan

Filed May 16, 1979, Ser. No. 39,580

Claims priority, application Japan, May 19, 1978, 53-58934

Int. Cl.³ H01J *29/45, 31/38*

U.S. Cl. 313—366 **9 Claims**



1. In a photosensor having at least a light-transmitting conductive layer which is arranged on the side of light incidence, and a photoconductive layer in which charges are stored in correspondence with the light incidence; a photosensor characterized in that said photoconductive layer is constructed of a single layer or a plurality of layers of photoconductive substances, and that at least a region of said photoconductive layer is made of an amorphous material which contains hydrogen and silicon as indispensable constituent elements thereof, in which the silicon amounts to at least 50 atomic % and the hydrogen amounts to at least 10 atomic % and at most 50 atomic %, and whose resistivity is not lower than 10^{10} Ω·cm.

4,255,687

LOW PRESSURE MERCURY VAPOR DISCHARGE LAMP

Hielke A. van Engelen, and Petrus J. M. Willemsen, both of Roosendaal, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jan. 19, 1979, Ser. No. 4,648

Claims priority, application Netherlands, Feb. 10, 1978, 7801534

Int. Cl.³ H01J *61/35, 61/42*

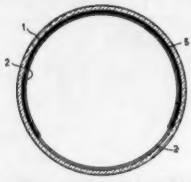
U.S. Cl. 313—488 **2 Claims**

1. A low pressure mercury vapor discharge lamp which comprises:

a cylindrical discharge vessel having an inner surface;

a reflecting layer containing titanium dioxide disposed on said inner surface except for an axially elongated aperture,

said reflecting layer containing a finite quantity of silicon dioxide which is up to 10% by weight of the total weight of said reflecting layer, said silicon dioxide having an average particle size which is substantially equal to 25 micrometers;



a luminescent layer disposed over substantially all of said reflecting layer and on said inner envelope over substantially all of said axially elongated aperture; and

said axially elongated aperture having a coating which is substantially free of silicon dioxide.

4,255,688

LIGHT EMITTER MOUNTED ON REFLECTOR FORMED ON END OF LEAD

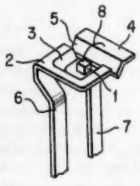
Hiroshi Nagasawa, Kawasaki, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kanagawa, Japan

Filed Dec. 13, 1978, Ser. No. 969,259

Claims priority, application Japan, Dec. 15, 1977, 52/150912; Jan. 17, 1978, 53/2718

Int. Cl.³ H01J *1/62, 63/04*

U.S. Cl. 313—499 **2 Claims**



1. A light emitting display device, comprising:

a first reflector including a first reflective surface having a substantially pyramid shaped face, said first reflector including a single cut-off portion in its reflective surface;

a first lead attached to said first reflector;

a light emitting element mounted on a flat surface within said reflector;

a second lead disposed adjacent to said cut-off portion of said first reflector, said second lead being spaced a fixed distance from said first reflector, said second lead including an upper portion having a second reflective surface which functions as a second reflector; and

a wire coupling said light emitting element to said second lead;

wherein said first and second reflectors together form a substantially pyramid shaped surface surrounding said light emitting element, said surface being interrupted only by said fixed distance between said second lead and said first reflector.

4,255,689

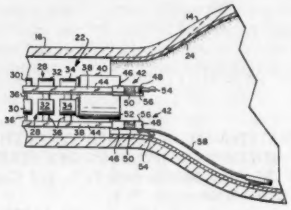
CATHODE RAY TUBE WITH RESISTOR MEANS ON GLASS SUPPORT RODS

Martin Fischman; Joseph L. Hallett, both of Seneca Falls, and Carl W. Penird, Waterloo, all of N.Y., assignors to GTE Products Corporation, Stamford, Conn.

Filed Apr. 16, 1979, Ser. No. 30,416

Int. Cl.³ H01J *29/88, 29/96*

U.S. Cl. 315—3 **1 Claim**



1. In a cathode ray tube having an evacuated envelope, an electron gun comprised of a plurality of axially aligned spaced apart electrodes including a final electrode disposed within said envelope, said electrodes being maintained in alignment by means of studs projecting therefrom being fixed in glass rods extending substantially parallel to said axis, and an internal electrically conductive layer on an interior surface of said envelope, the improvement comprising: electrical resistor means formed on extensions of said rods which project beyond said final electrode, said resistor means connecting said final anode to said internal electrically conductive layer, said resistor means including means for centering said gun in said tube and comprising on each rod a spaced pair of conductive coatings with a resistor material therebetween and connected thereto, one of each of said pairs of said conductive coatings on each rod being electrically connected to said final anode and the other one of said pairs of conductive coatings being electrically connected to a conductive snubber which is in electrical contact with said conductive layer.

4,255,690

CATHODE HEATING APPARATUS FOR AN ELECTRONIC POWER TUBE

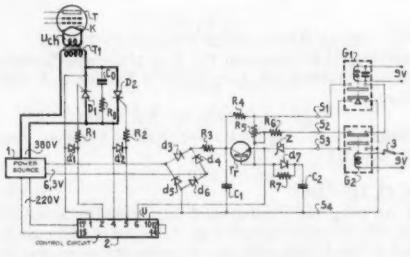
Jean-Claude Lecornet, Paris, France, assignor to Thomson-CSF, Paris, France

Filed Jun. 7, 1979, Ser. No. 46,450

Claims priority, application France, Jun. 13, 1978, 78 17620

Int. Cl.³ H05B *39/04, 41/06*

U.S. Cl. 315—106 **5 Claims**



1. An apparatus for heating a cathode of an electronic power tube having a direct heated cathode, said apparatus comprising: feeding means for feeding a heating current to said cathode; interrupter circuit means for interrupting said feeding of a

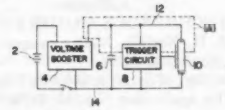
current to said cathode; and control means coupled to said interrupter circuit means for controlling the interruptions by said interrupter circuit, with a predetermined frequency, and with a duration of passing of current which varies as a function of time which has elapsed, for bringing said heating current from O to Io, which is the effective value of said heating current for which said tube is in a pre-heating condition, and for then bringing said heating current from Io to Im which is the effective value of said heating current when said tube is in its normal operating condition, Im being greater than Io.

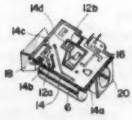
4,255,691

SHOCKPROOF ELECTRONIC FLASH DEVICE

Tetsuhiko Inagaki, and Toshinori Imura, both of Sakai, Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Apr. 27, 1979, Ser. No. 33,788
Claims priority, application Japan, Apr. 29, 1978, 53-51907
Int. Cl.³ H05B *41/32*
U.S. Cl. 315—241 P **11 Claims**





1. An electronic photoflash device comprising a direct current high-voltage source including a high-voltage terminal and a ground terminal, a main storage capacitor including a high-voltage terminal and a ground terminal, a photoflash tube including a high-voltage terminal and a ground terminal, means including a first conductor interconnecting said high-voltage terminals and means including a second conductor connecting said ground terminals and characterized in that said second conductor includes a portion which substantially encompasses and is proximate at least a portion of said first conductor and a surface extending between said conductor portions whereby the deposition of water on said surface effects the short-circuiting of said conductors and the discharge of said capacitor.

4,255,692

NON-LIGHT PRODUCING PHOSPHOR ENERGIZABLE LAMP SIMULATOR AND METHODS OF USING SAME AND MAKING SAME

David Burgess, 1341 W. 130th St., Gardena, Calif. 90247

Filed Sep. 7, 1979, Ser. No. 73,223
Int. Cl.³ H05B *41/16*
U.S. Cl. 315—324 **27 Claims**

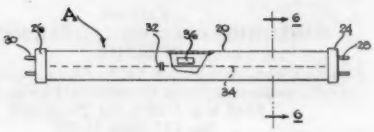
1. A substitute lamp simulator as a replacement for a phosphor energizable lamp in a plural lamp fixture, said lamp simulator comprising:

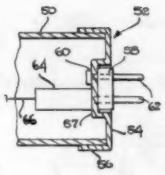
(a) a lamp housing,

(b) end caps on each of the opposite ends of said housing,

(c) terminal means on each of said end caps capable of being fitted into connectors which receive the terminals of a phosphor energizable lamp,

(d) a capacitor physically mounted on one of said end caps and being electrically connected to the terminal means on said end cap, and





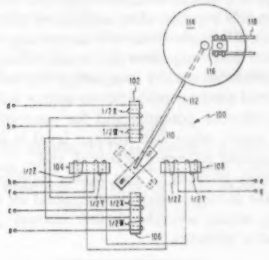
(e) electrical conductor means electrically connecting said capacitor to the terminal means on the other of said end caps.

4,255,693

CLOSED LOOP STEPPER MOTOR CIRCUITRY WITHOUT ENCODER

Steven D. Keidl, Rochester, Minn., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 29, 1979, Ser. No. 89,324
Int. Cl.³ G05B *19/40*
U.S. Cl. 318—685 **15 Claims**



1. In combination,

an electrical stepping motor having a plurality of motor coils and a rotatable armature,

a driver including switching circuitry and connected with said motor coils for consecutively applying an EMF to said motor coils on switching of the driver to cause rotation of said armature,

an oscillator,

a phase locked loop circuit driven by said oscillator and including a voltage controlled wave generator having a plurality of output connections to said driver to drive the driver so that the driver causes consecutive energization of said motor coils for driving said armature,

a control connection connected with one of said motor coils for providing a voltage which is the composite of the back EMF in said motor coil and the drive EMF applied to said coil from said driver,

a multiplier circuit having said control connection and one of said loop circuit output connections connected to it as inputs to thereby provide an error output signal, and

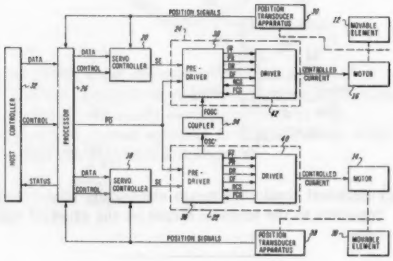
means for applying said error output signal to a point in said phase locked loop circuit so that said driver effectively holds the speed of said armature within close limits.

4,255,694

POWER AMPLIFIER WITH POWER MONITOR CIRCUIT

Lyle E. Morris, Newark, and Kai C. K. Sun, Saratoga, both of Calif., assignors to Xerox Corporation, Stamford, Conn.

Filed Aug. 2, 1979, Ser. No. 63,639
Int. Cl.[3] G05B *23/02*
U.S. Cl. 318—565 **4 Claims**



1. A power amplifier for controlling the current flow through a load, comprising:

a plurality of switching elements connected in bridge fashion with said load and a first predetermined power source for coupling the load across alternate output terminals of said first predetermined power source in accordance with the levels of a plurality of control signals respectively applied to said plurality of switching elements;

generating means operatively coupled to a second predetermined power source for generating said control signals;

coupling means capable when enabled of coupling each of said control signals from said generating means to the respective switching element for controlling same;

power monitor means for comparing the voltage level of said second predetermined power source with a predetermined reference potential and for generating a current disable signal when said voltage level is less than said predetermined reference potential; and

disable means coupled to said power monitor means and responsive to said current disable signal for disabling said coupling means whereby further current flow through said load is inhibited.

4,255,695

METHOD AND APPARATUS FOR CONTROL OF INVERTER SYNCHRONOUS MACHINE DRIVE SYSTEM

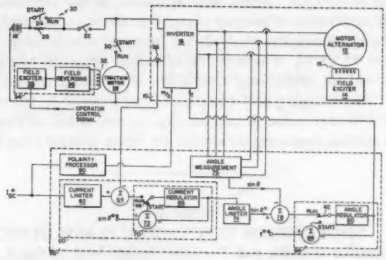
Allan B. Plunkett, and Fred G. Turnbull, both of Scotia, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Sep. 25, 1978, Ser. No. 945,625
Int. Cl.[3] H02P *1/46, 7/42*
U.S. Cl. 318—723 **14 Claims**

1. An improved method for controlling a synchronous machine excited by variable frequency alternating voltage produced by an inverter, said method comprising the steps of:

(a) generating a phase angle command signal which is responsive to a fixed phase angle value during initial machine excitation intervals and is responsive to operator-commanded variation during other than initial machine excitation intervals;

(b) generating a frequency command signal proportional in magnitude to the angle difference between said phase angle command signal and a signal representing the actual phase angle difference between the machine air gap flux and current; and



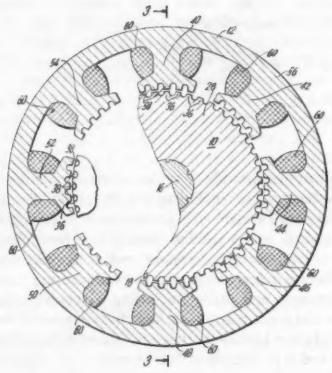
(c) varying excitation of said synchronous machine in response to said frequency command signal.

4,255,696

SYNCHRONOUS MOTOR SYSTEM

John H. Field, II, Norfolk, Mass., assignor to Sigma Instruments, Inc., Braintree, Mass.

Continuation-in-part of Ser. No. 654,400, Feb. 2, 1976, Pat. No. 4,053,966. This application Nov. 17, 1976, Ser. No. 742,690
Int. Cl.[3] G05B *19/40*
U.S. Cl. 318—696 **14 Claims**



1. A synchronous motor system responsive to input pulses, comprising a motor including a stator and a rotor movable relative to each other about a common axis, said stator having a plurality of radially directed stator poles, said poles having stator teeth arranged in a circle around the axis, said rotor having a plurality of rotor teeth arranged about the axis, said rotor teeth being permanently magnetized, a plurality of winding means on said stator poles for inducing magnetic fields in said poles in radial directions; and circuit means coupled to said winding means and responsive to input pulses, said circuit means including a plurality of switches each connected in series with one of said winding means, said circuit means including driver means coupled to said switches and responsive to the pulses for rendering a plurality of said switches conductive simultaneously and energizing said winding means simultaneously, said driver means including means for energizing said winding means and inducing magnetic fields in the poles in given directions, deenergizing the winding means on alternate ones of the poles, reenergizing the deenergized ones of the winding means in reverse directions, deenergizing the winding means on the poles intermediate the alternate poles, and reenergizing the winding means on the poles intermediate the

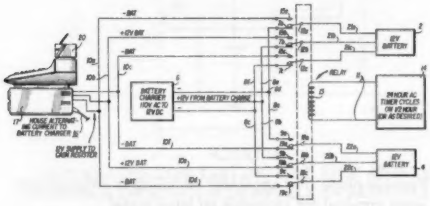
alternate poles in a direction reverse to the original direction of energization.

4,255,697

CASH REGISTER POWER SUPPLY SYSTEM

Philip H. Buhler, III, Springfield, Va., assignor to David Edwards, Vienna, Va.

Filed Jan. 21, 1980, Ser. No. 113,528
Int. Cl.³ H02J *7/00, 9/00*
U.S. Cl. 320—6 **6 Claims**



1. In combination with a cash register having a memory, a cash register power supply system, said system comprising:
   a. first and second batteries;
   b. a battery charging system comprising:
      1. an alternating current power source;
      2. a battery charger;
      3. said first battery;
      4. electrical connections between the alternating current power source and the battery charger; and
      5. electrical connections between the battery charger and the first battery;
   c. a work system comprising:
      1. said cash register having said memory;
      2. said second battery; and
      3. electrical connections between the cash register and the second battery;
   d. switching means electrically connecting said battery charging system and said work system, such that upon activation of the switching means, said first battery becomes part of the work system and said second battery becomes part of the battery charging system;
   e. activation means for the switching means, such that the switching means is activated at regular time intervals; and
   f. said alternating current power supply and said cash register having said memory, wherein;
      1. said alternating current power supply and said cash register having said memory are electrically connected by said battery charging system, said work system, said switching means, and said activation means; and
      2. said alternating current power supply is isolated from said cash register having said memory by said battery charging system, said work system, said switching means, and said activation means.

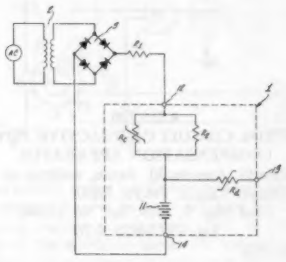
4,255,698

PROTECTION OF BATTERIES

Henry I. Simon, Los Altos, Calif., assignor to Raychem Corporation, Menlo Park, Calif.

Filed Jan. 26, 1979, Ser. No. 6,773
Int. Cl.³ H02J *7/04;* **H02H** *5/04*
U.S. Cl. 320—35 **50 Claims**

1. A method of recharging a battery comprising one or more secondary cells and having a capacity of C ampere hours, which method comprises passing current through the cell or cells while they are part of a circuit which also comprises a source of DC power and an electrical device which
   (i) is connected in series with the cell or cells of the battery;
   (ii) is in thermal contact with at least one cell of the battery;
   (iii) comprises a PTC element and at least two electrodes which are placed so that current flows through said PTC element; and
   (iv) has an electrical power/temperature relationship and is capable of dissipating heat at a rate such that
      (A) when the current is initially passed through the circuit, the circuit is in a rapid-charging condition in which there is a rapid-charging current through the cell or cells of the battery of at least 0.25C, and there is a stable equilibrium between the rate at which the device generates heat by I^2R heating and the rate at which heat is lost from the device; and
      (B) when the rapid-charging current has recharged the cell or cells to a certain state of charge and in consequence the cell or cells and the device have reached elevated temperatures, the rate at which the device generates heat by I^2R heating exceeds the rate at which heat is dissipated from the device and thus causes the temperature and the resistance of the device to rise rapidly, and thereafter the circuit reaches a trickle-charging condition, in which condition there is a trickle-charging current through the cell or cells which is less than half said rapid-charging current and is from 0.03C to 0.2C amps and in which condition the rate at which the device generates heat by I^2R heating is equal to the rate at which heat is dissipated from the device, said trickle-charging condition being maintained so long as current continues to pass through the circuit.

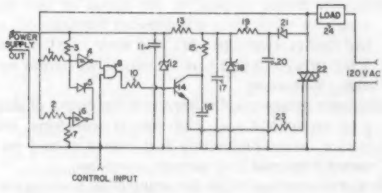


4,255,699

PHASE MODULATED POWER CONTROL

Noel M. Calvin, 2683 Buena Vista, Berkeley, Calif. 94708

Filed Apr. 19, 1979, Ser. No. 31,417
Int. Cl.³ G05F *5/00*
U.S. Cl. 323—322 **8 Claims**



1. A method for applying AC power to a load while maintaining a voltage across a capacitor for use as a power supply without the need for a parallel connection to the AC power lines, comprising in combination the steps of:
   Applying power to the load through a switch, said switch being responsive to the AC power supply voltage such that it opens when the voltage passes through zero each cycle, and closes again when the voltage exceeds a preset threshold in either the positive or negative polarity;
   charging a capacitor to the peak voltage present across said

switch through a diode such that when the switch is always off and no power is applied to the load said capacitor is charged to a voltage equal to the peak power supply voltage, and when power is applied to the load the capacitor is charged to a voltage equal to either the positive or the negative switching threshold, determined by the polarity of said diode;

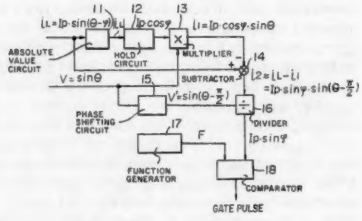
and feeding the voltage present across said capacitor through a voltage regulator to produce a constant voltage for use as a power supply.

4,255,700

CONTROL CIRCUIT OF REACTIVE POWER COMPENSATION APPARATUS

Masatoshi Takeda, Amagasaki, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 9, 1979, Ser. No. 18,940
Int. Cl.³ H02J 3/18
U.S. Cl. 323—210 **12 Claims**



1. In a control circuit for a reactive power compensation apparatus including a reactor and a capacitor connected in parallel between a power source and a load to perform phase control of current passing through said reactor by means of a control switching element coupled in series with said reactor, an improvement comprising:

means for detecting the instantaneous value of a load current waveform passing through said load at a predetermined phase angle of the source voltage waveform supplied by said power source;

multiplier means coupled to the output of said detecting means for multiplying said detected instantaneous value of said load current with a first sine wave, said first sine wave being related to said source voltage waveform by a first phase difference;

subtractor means coupled to receive the output of said multiplier means and said load current waveform, said subtractor means subtracting said output of said multiplier means from said load current waveform;

divider means coupled to the output of said subtractor means for dividing the output of said subtractor means by a second sine wave, said second sine wave being related to said source voltage waveform by a second phase difference; and

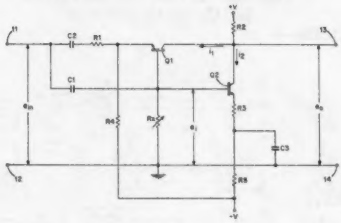
generator means coupled to the output of said divider means for generating a gate pulse for said control switching element, said generator means performing a comparison between the output of said divider means and a rating function generated in synchronism with the peak value of said source voltage waveform.

4,255,701

VARIABLE PHASE SHIFT APPARATUS

William L. Geller, Framingham, Mass., assignor to GTE Laboratories Incorporated, Waltham, Mass.

Filed Dec. 13, 1979, Ser. No. 103,021
Int. Cl.³ H04N 9/12
U.S. Cl. 323—217 **8 Claims**



1. Variable phase shift apparatus including in combination an input terminal for receiving an input signal;

first transistor means;

second transistor means;

phase control means connected to the input terminal for producing a phase control signal of variable magnitude;

said first transistor means being connected to the input terminal and to the phase control means and being operable to produce a first signal in phase with the difference between the input signal and the phase control signal, said first signal increasing in magnitude as the magnitude of the phase control signal decreases and decreases in magnitude as the magnitude of the phase control signal increases;

said second transistor means being connected to the phase control means and being operable to produce a second signal at 180° phase shift with respect to the phase control signal, said second signal increasing in magnitude as the magnitude of the phase control signal increases and decreasing in magnitude as the magnitude of the phase control signal decreases; and

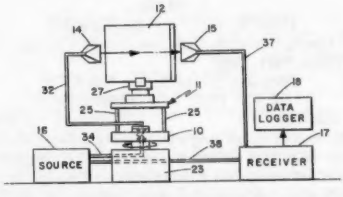
output means connected to the first and second transistor means for combining the first and second signals to produce an output signal which is the resultant thereof.

4,255,702

MEASUREMENT OF RADIANT ENERGY SCATTERING CHARACTERISTICS WITH A TURNTABLE-TYPE SCANNING APPARATUS

Gus P. Tricoles, San Diego, and Eugene L. Rope, El Cajon, both of Calif., assignors to General Dynamics/Electronics Division, San Diego, Calif.

Filed Dec. 18, 1978, Ser. No. 970,527
Int. Cl.³ G01R 27/04
U.S. Cl. 324—58 B **13 Claims**



1. A scanning apparatus, for enabling measurement of radiant energy scattering characteristics of a test panel, comprising a turntable;

support means on the turntable for supporting said test panel in a selected position along the axis of the turntable;

a first antenna radially mounted to the turntable for rotation with the turntable and directed toward the selected position of a said supported test panel; and

a second antenna in a fixed stationary position relative to the turntable and directed toward the selected position of a said supported test panel.

4,255,703

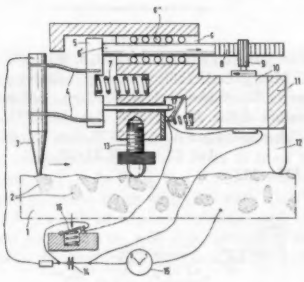
APPARATUS FOR TESTING THE SIZE AND THE SPACINGS OF SILICON CRYSTALS IN AL-SI ALLOYS

Wolfgang Dutschke, Leonberg-Eltingen, Fed. Rep. of Germany, assignor to Fraunhofer-Gesellschaft zur Förderung der angewandten Forschung e.V., Münich, Fed. Rep. of Germany

Filed Feb. 15, 1979, Ser. No. 12,426

Int. Cl.[3] G01R *27/02*; G01N *27/00*

U.S. Cl. 324—71 CP **9 Claims**



1. Apparatus for testing the size and spacings of silicon crystals in Al-Si alloys, comprising:

(a) housing means adapted to be supported on a surface of an article composed of said alloy;

(b) carrier means mounted on said housing means for movement along a horizontal path relative to said housing means;

(c) a pointed scanning needle;

(d) means mounting said scanning needle on said carrier means and biasing said scanning needle in the direction of the surface of said article such that with movement of said carrier means along said path the point of said scanning needle contacts the surface of said article with a predetermined force as it moves across said surface;

(e) means for driving said carrier along said path;

(f) a source of electrical current;

(g) voltage indicating means; and

(h) circuit means for electrically connecting said article with said scanning needle, said source of electrical current and said voltage indicating means;

(i) whereby the size and spacings of the silicon crystals in said alloy may be determined by the variation of electrical current through said circuit means as indicated by said voltage indicating means during the time period that the point of said scanning needle moves across said surface of said article.

4,255,704

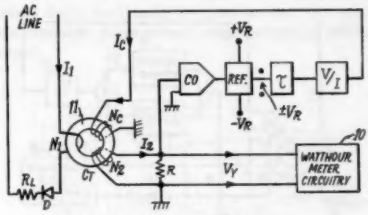
ZERO CROSSING DETECTION AND ELECTRONIC COMPENSATION OF D. C. SATURATION MAGNETIZATION IN CURRENT TRANSFORMERS USED IN WATTHOUR METER INSTALLATIONS

Miran Milkovic, Scotia, N.Y., assignor to General Electric Company, Somersworth, N.H.

Filed Oct. 1, 1979, Ser. No. 80,553

Int. Cl.[3] G01R *1/20*; G05F *1/24*

U.S. Cl. 324—127 **7 Claims**



1. In a watthour meter installation of the type including an input transformer having an input winding for connection to an alternating current power supply line, an output winding connected to the watthour meter for measuring alternating current power being consumed and a core on which said input and output windings are wound and which is susceptible to magnetization saturation by a DC component superimposed on the alternating current power being measured; the improvement comprising compensation circuit means for compensating for the effect of the DC component on the power measurement achieved with the watthour meter, said compensation circuit means comprising:

(a) sensing means coupled to sense the current flowing through said input winding and for deriving a sensed output signal proportional to the sensed current and which includes the AC and DC components of the current flowing through said input winding;

(b) sensed signal processing circuit means coupled to said sensing means for deriving from said sensed output signal a feedback signal which is proportional to the DC component of the current flowing through said input winding, said sensed signal processing circuit means comprising;

(i) current to voltage signal conversion circuit means supplied with said sensed signal for converting the same to a voltage signal,

(ii) zero crossing sensing circuit means supplied with the voltage signal for sensing the zero crossings of the voltage signal in either a positive going or negative going direction relative to a reference voltage level and for deriving aperiodic zero crossing signals indicative of the occurrence of the zero crossings;

(iii) amplitude referencing circuit means responsive to said aperiodic zero crossing output signals for deriving a series of essentially constant amplitude varying duration positive and negative going square waveshape signals representative of the distortion of the waveshape of the sensed signal due to the superimposed DC component,

(iv) averaging circuit means responsive to said amplitude referenced varying period positive and negative going square wave signals for deriving an average output voltage signal representative of the superimposed DC component, and

(v) voltage to current signal conversion circuit means responsive to the average output voltage signal for converting the same to a current feedback signal; and

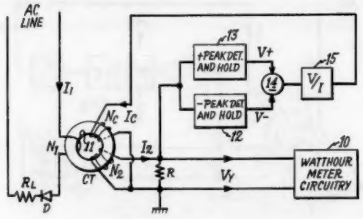
(c) compensating winding means wound on said transformer core and having said current feedback signal supplied thereto in a direction to automatically cancel out the effects of the DC component on the magnetization characteristics of said input transformer.

4,255,705

PEAK DETECTION AND ELECTRONIC COMPENSATION OF D. C. SATURATION MAGNETIZATION IN CURRENT TRANSFORMERS USED IN WATT HOUR METER INSTALLATIONS

Miran Milkovic, Scotia, N.Y., assignor to General Electric Company, Somersworth, N.H.

Filed Sep. 24, 1979, Ser. No. 78,058
Int. Cl.[3] G01R 1/20; G05F 1/12
U.S. Cl. 324—127 7 Claims



1. In a watt hour meter installation of the type including an input transformer having an input winding for connection to an alternating current power supply line, an output winding for connection to a watt hour meter for measuring alternating current power being consumed and a core on which said input and output windings are wound and which is susceptible to magnetization saturation by a D. C. component superimposed on the alternating current power being measured; the improvement comprising automatic compensation circuit means for compensating automatically for the effect of the D. C. component on the power measurement achieved with the watt hour meter installation; said automatic compensation circuit means comprising:

(a) sensing means coupled to sense the current flowing through said input winding and for deriving a sensed output signal proportional to the sensed current and which includes the A. C. and the D. C. components of the current flowing through said input winding,

(b) sensed signal processing circuit means coupled to said sensing means for deriving from said sensed output signal a feedback signal which is proportional to the D. C. component of the current flowing through said input winding, said sensed signal processing circuit means comprising

(i) current to voltage signal conversion circuit means supplied with said sensed signal for converting the same to a voltage signal,

(ii) peak voltage signal detecting circuit means supplied with said voltage signal,

(iii) holding circuit means responsive to the output from said peak voltage signal detecting circuit means for holding the peak voltage output thereof over at least one full cycle of the supply alternating current,

(u) summation circuit means responsive to the peak voltage output for deriving a difference signal proportional to the superimposed D. C. component,

(v) voltage to current signal conversion circuit means responsive to the output from said summation circuit means for converting the difference signal to a current signal for use as the feedback signal, and

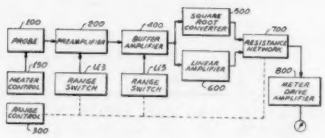
(c) compensating winding means wound on said input transformer core having said feedback signal supplied thereto in a direction to automatically cancel out the effects of the D. C. component on the magnetization characteristics of said input transformer.

4,255,706

BROADBAND VOLTMETER

Haig Soojian, Upper Saddle River, N.J., assignor to Ballantine Laboratories, Inc., Boonton, N.J.

Filed Jul. 20, 1978, Ser. No. 926,507
Int. Cl.[3] G01R 15/10, 15/08
U.S. Cl. 324—132 12 Claims



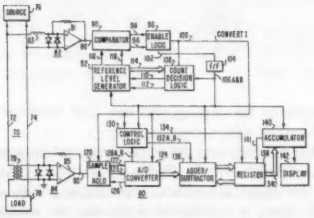
1. A voltmeter comprising a diode detector, a square root converter and a linear amplifier each connected to receive the diode detector output signal, a resistance network connected to receive the outputs of the square root converter and the linear amplifier, means for selectively switching the resistances of the resistance network to change the proportion at the resistance network output between the signal from the square root converter and the signal from the linear amplifier to inversely match the response curve of the diode detector, and means for displaying the amplitude value of the resistance network output signal.

4,255,707

ELECTRICAL ENERGY METER

Robert C. Miller, Penn Hills Township, Allegheny County, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Continuation of Ser. No. 919,874, Jun. 26, 1978, abandoned.
This application Aug. 7, 1979, Ser. No. 64,603
Int. Cl.[3] G01R 21/00
U.S. Cl. 324—142 20 Claims



1. Meter apparatus for measuring a parameter of an electrical energy quantity occurring in an electrical power distribution system comprising:

input means for generating first and second input signals representative of certain ones of the voltage and current components of said electrical energy quantity occurring on said electrical power distribution system, with said first input signal being proportional to the time integral of one of said voltage and current components and said second input signal being directly proportional to one of said voltage and current components:

means for sampling said second input signal at predetermined instants, which are a function of unit changes in the magnitude of said first input signal, said sampling means providing the instantaneous magnitude of said second input signal at each of said predetermined instants;

means, responsive to said sampling means, for generating signal representations of said instantaneous magnitudes of said second input signal;

accumulator means for accumulating successive ones of said

signal representations, said accumulator means providing totalized values which are proportional to the time integral of the product of said certain ones of the components being represented by said first and second input signals over a predetermined period of time; and

output means, responsive to said totalized values, for providing data output signals representative of the measured parameter of electrical energy quantity.

4,255,708

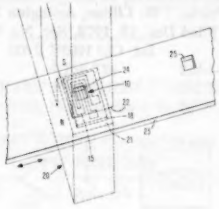
MAGNETORESISTIVE POSITION TRANSDUCER WITH INVARIABLE PEAK SIGNAL

Joseph T. Wilson, III, Endicott, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 15, 1978, Ser. No. 970,070

Int. Cl.³ G01R *33/12;* H01L *43/08*

U.S. Cl. 324—208 **13 Claims**



1. Magnetic transducer apparatus for detecting motion of a movable member having regions of differing magnetic flux comprising: a substrate; a first plurality of strips of magnetoresistive material interconnected at their ends to form a first continuous path, a second plurality of strips of magnetoresistive material interconnected at their ends to form a second continuous path, said paths lying in a common plane on said substrate, being joined in series with each path lying between and connected to a pair of adjacent terminals and symmetrically disposed about an axis, said axes coinciding and being perpendicular to the direction of motion of said movable member.

4,255,709

DEVICE FOR PROVIDING AN ELECTRICAL SIGNAL PROPORTIONAL TO THE THICKNESS OF A MEASURED COATING WITH AN AUTOMATIC RANGE SWITCH AND SENSITIVITY CONTROL

Nikolai N. Zatsepin, ulitsa A. Kulmana, 15, kv. 203; Siljuk, Viktor F., ulitsa Gorkogo, 143, kv. 22; Ivan I. Malko, ulitsa Shirokaya, 36, kom. 315-B, all of Minsk; Valentin A. Kaloshin, Kronshtadsky bulvar, 43, korpus 3, kv. 271, Moscow; Valery M. Aniskovich, Krasivy proezd, 5, Minsk; Nikolai N. Naumenko, ulitsa Litovskaya, 30, korpus 2, kv. 10, Minsk, and Vladimir V. Perfiliev, ulitsa Gogolya, 14-a, kv. 12, Khimki Moskovskoi oblasti, all of U.S.S.R.

Filed Sep. 22, 1978, Ser. No. 944,976

Int. Cl.³ G01B *7/06;* G01R *15/10, 15/08*

U.S. Cl. 324—229 **4 Claims**

1. A device for measuring the thickness of coatings, comprising:

an electric signal generator having an output;

a thickness gauge having an input connected to said output of said electric signal generator, and an output;

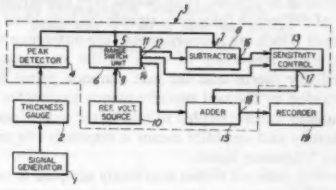
a conversion circuit for converting an electric signal at said output of said thickness gauge to an electric signal of a magnitude proportional to the coating thickness being measured, having an input connected to said output of said thickness gauge, and an output;

a peak detector of said conversion circuit, having an input which serves as said input of said conversion circuit, and an output;

an automatic measurement range switching unit of said conversion circuit, having a first input electrically coupled to said output of said peak detector, a second input and a first, second, and third output;

a reference voltage forming unit of said conversion circuit, having an output connected to said second input of said automatic measurement range switching unit;

a subtractor of said conversion circuit, having a first input electrically coupled to said output of said peak detector, a second input electrically coupled to said first output of said automatic measurement range switching unit, and an output;



a measuring sensitivity control unit of said conversion circuit, having a first input connected to said output of said subtractor, a second input electrically coupled to said second output of said automatic measurement range switching unit, and an output;

an adder of said conversion circuit, having a first input connected to said output of said measuring sensitivity control unit and a second input connected to said third output of said automatic measurement range switching unit, and an output which serves as said output of said conversion circuit;

a recorder having an input connected to said output of said adder.

4,255,710

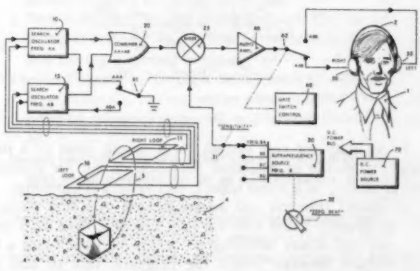
PLURAL SEARCH FREQUENCY DIRECTIONAL METAL DETECTOR APPARATUS HAVING ENHANCED SENSITIVITY

Harold J. Weber, 20 Whitney Dr., Sherborn, Mass. 01770

Filed May 19, 1978, Ser. No. 907,673

Int. Cl.³ G01V *3/11, 3/165;* H03B *1/00*

U.S. Cl. 324—328 **11 Claims**



1. A directional beat frequency concealed metal object detector apparatus adapted usually as a means for sensing the presence of an object, establishing the effectively right or left bearing of the object relative to the detector, and accurately spotting the location of the concealed object, said apparatus comprising:

a. plural exploratory loop antennae means, including at least

an effectively right hand antenna element and an effectively left hand antenna element;

b. plural search signal oscillator means, having each oscillator thereof effectively coupled to but one of the said antenna elements;

c. suprafrequency signal generative means for providing at least one common prime frequency, say beat frequency, signal therefrom which exhibits a recurrent periodicity which approximates a greater than one integral multiple of any of the said search signal fundamental periodicities;

d. Heterodyne detector, say mixer, means providing a first input port means coupled in an effectively separate and alternate way to each said search oscillator means and having an effectively common second input port means coupled to said suprafrequency generative means, operative so as to provide at an output port therefrom a plurality of difference frequency signals the individual periodicities of which are proportional to the difference between a harmonic frequency of each of the said search signal oscillator means and the said common prime frequency provided by the said suprafrequency generative means;

e. amplifier means coupled to said mixer output port means, whereby said amplifier means is responsive to said difference frequency signal;

f. plurality indicant means alternately coupled to said plural amplifier means so as to provide at least two separate, say right and left, difference frequency signals therefrom, the periodicity of each which changes in hertz at a rate which is at least two times as great in hertz relative to that of any individual search frequency signal oscillator change, say diviation in herzt; and,

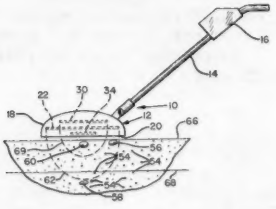
g. d.c. power source operatively connected to each said oscillator means, suprafrequency generative means, mixer means, and amplifier means.

4,255,711

COIL ARRANGEMENT FOR SEARCH HEAD OF A METAL DETECTOR

Fredrick H. Thompson, Forest Grove, Oreg., assignor to Compass Electronics Corporation, Forest Grove, Oreg.

Filed May 15, 1979, Ser. No. 39,175
Int. Cl.³ G01V *3/08*
U.S. Cl. 324—329 **14 Claims**



1. An inductor coil system for a search head of a metal detector having an electrical detection circuit for indicating the proximity of a metal object, said system comprising:

(a) planar transmit coil means located in a first plane for producing a first time-varying magnetic field, said transmit coil means including a current path enclosing a first surface through which the magnetic flux of said first magnetic field passes;

(b) planar cancel coil means of smaller size than said transmit coil means for producing a second time-varying magnetic field in opposition to said first time-varying magnetic field, said cancel coil means including a current path enclosing a second surface through which the magnetic flux of said second magnetic field passes, said cancel coil means being located in a plane parallel to that of said transmit coil means, a portion of said magnetic flux of said first magnetic field also passing through said second surface; and

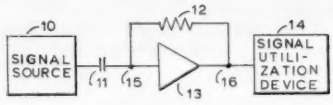
(c) planar receive coil means of smaller size than said cancel coil means for producing a magnetically-induced electric receive signal, said receive coil means including a current path enclosing a third surface, a portion of said magnetic flux of said first magnetic field also passing through said third surface, and a portion of said magnetic flux of said second magnetic field also passing through said third surface, said first and second magnetic fields inducing opposing voltages in said receive coil means, said receive coil means being electrically connected to said detection circuit.

4,255,712

DIGITAL WAVEFORM CONDITIONING CIRCUIT

Adelore F. Petrie, 7 W. Lillian, Arlington Heights, Ill. 60004

Filed Dec. 18, 1978, Ser. No. 970,859
Int. Cl.³ H03K *5/00*
U.S. Cl. 328—162 **10 Claims**



1. A digital waveform conditioning circuit for use in digital information systems for shifting levels or eliminating low frequency interference from applied signals comprising:

non-inverting digital amplifier means, responsive to said applied signals, having an input terminal and an output terminal, and

feedback means, coupled to said non-inverting digital amplifier means, combining the functions of differentiating said applied signals and adding a portion of the output signal in phase aiding to said differentiated applied signals,

said feedback means including a means to provide positive feedback bias to said input terminal of said non-inverting digital amplifier means, causing its output to remain in a high or low state as determined by said applied signals, after removal of said applied signals, and not return to the undesired indeterminate state, or a fixed quiescent state.

4,255,713

CARRIER REGENERATION CIRCUIT FOR POLYPHASE MODULATION SYSTEM

Yasuharu Yoshida, Tokyo, Japan, assignor to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Mar. 2, 1979, Ser. No. 16,848
Claims priority, application Japan, Mar. 3, 1978, 53/24643
Int. Cl.³ H03D *3/18*
U.S. Cl. 329—50 **12 Claims**

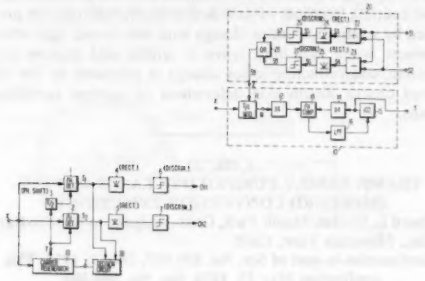
1. A carrier regeneration circuit comprising:

first and second means for quadrature detecting an n(=8, 9)-valued polyphase modulated wave including signal vectors arranged in lattice form with a reference carrier wave to produce a first and a second demodulated signal, respectively,

means responsive to said modulated wave for regenerating said reference carrier wave phase-locked at a multiple of $\pi/2$ radians under a control signal, and

decision circuit means for phase shifting said first and second

demodulated signals by $\pi/4$ radians and discriminating and combining the levels of the phase-shifted first and



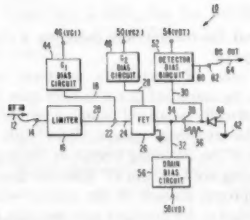
second demodulated signals to produce said control signal.

4,255,714

GAAS DUAL-GATE FET FREQUENCY DISCRIMINATOR

Arye Rosen, Cherry Hill, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Feb. 21, 1979, Ser. No. 13,604
Int. Cl.[3] H03D *3/26*
U.S. Cl. 329—103 **10 Claims**



1. A microwave frequency discriminator for input RF microwave frequency signals of substantially constant power level comprising:

a transistor amplifier including a dual-gate field effect transistor having first and second control gate electrodes and input and output electrodes; means coupled to said first control gate electrode and said input and output electrodes for separately biasing said electrodes at predetermined bias voltages that produce in response to said input RF signal at said first control gate electrode an output RF signal at said output electrode having a predetermined frequency versus gain roll-off characteristic over a predetermined frequency band;

means coupled to said second control gate electrode for biasing said second control gate electrode at a predetermined bias voltage in relation to the biasing of said first control gate electrode and said input and output electrodes that produces said output RF signal with a more linear frequency versus gain roll-off characteristic over said predetermined frequency band;

said first-mentioned biasing means including means coupled to said first control gate electrode for controlling the input impedance of said transistor and means coupled to said output electrode for controlling the output impedance of said transistor, said second-mentioned biasing means including means coupled to said second control gate electrode for further controlling the output impedance of said transistor;

detector means responsive to said output RF signal for producing a dc signal proportional to the amplitude of said output RF signal; and

detector biasing means coupled to said detector means responsive to a predetermined bias voltage for controlling the input impedance of said detector means so as to provide matching with the output impedance of said transistor;

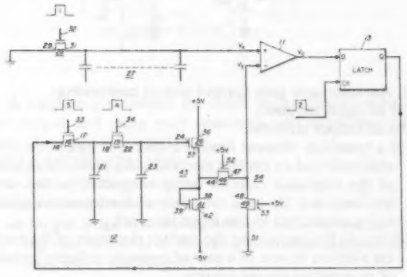
whereby at said conditions of matched impedances said dc signal varies substantially linearly as a function of the frequency of said input RF signal.

4,255,715

OFFSET CORRECTION CIRCUIT FOR DIFFERENTIAL AMPLIFIERS

Michael Cooperman, Framingham, Mass., assignor to GTE Laboratories Incorporated, Waltham, Mass.

Filed Aug. 27, 1979, Ser. No. 70,192
Int. Cl.[3] H03F *1/02*
U.S. Cl. 330—9 **23 Claims**



1. In combination,

differential amplifier means having a first input terminal for receiving a signal V_X, a second input terminal for receiving a signal V_Y, and an output terminal, said output terminal being adapted to provide an output signal therefrom based upon the polarity of $(V_X - V_Y + V_Z)$, wherein V_Z is an offset error of said amplifier; and

an offset correction circuit comprising

a latching circuit coupled to receive said output signal and store its polarity, said latching circuit providing a positive latching signal upon receipt of an output signal of a first polarity from said amplifier and providing a negative latching signal upon receipt of an output signal of a second polarity from said amplifier;

a first capacitor, having a capacitance C_1, having one terminal coupled to a first point of reference potential, and having a second terminal;

a second capacitor having a capacitance C_2, wherein C_2 is larger than C_1, having one terminal coupled to a second point of reference potential, and having a second terminal;

means operative during a first time period for causing said first input terminal to be at a third point of reference potential;

means operative during a second time period for storing the polarity of said output signal;

means operative during a third time period for charging said first capacitor, via its second terminal, with a latching signal from said latching circuit;

means operative during a fourth time period for coupling said first capacitor second terminal to said second capacitor second terminal;

buffer means, having an input terminal coupled to said second capacitor second terminal, for providing a low output impedance onto an output terminal therof; and

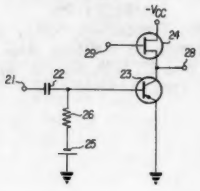
attenuation means coupling said buffer means output terminal to said second input terminal.

4,255,716

AUTOMATIC GAIN CONTROL CIRCUIT

Shigeho Takada, Oita, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Sep. 6, 1978, Ser. No. 940,021
Claims priority, application Japan, Sep. 10, 1977, 52/109136; Sep. 10, 1977, 52/109137
Int. Cl.[3] H03G 3/30
U.S. Cl. 330—284 3 Claims



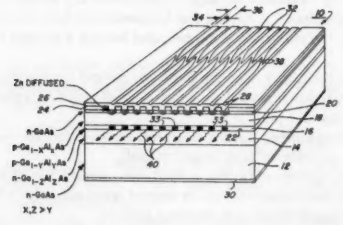
3. An automatic gain control circuit comprising:
(a) an input terminal;
(b) an output terminal;
(c) a transistor element having a collector electrode, a base electrode and an emitter electrode, the collector electrode of the transistor element being connected to the output terminal, and the base electrode of the transistor element being connected to the input terminal;
(d) means for connecting the emitter electrode of the transistor element to one of a pair of opposite polarity terminals of an external power source;
(e) a variable resistance element; and
(f) means for connecting the variable resistance element between the collector electrode of the transistor element and the other of the pair of opposite polarity terminals of the external power source;
(g) the resistance of the variable resistance element being controlled according to the output of the transistor element with linear characteristics, where said variable resistance element is a junction type field-effect transistor.

4,255,717

MONOLITHIC MULTI-EMITTING LASER DEVICE

Donald R. Scifres, Los Altos; William Streifer, Palo Alto, and Robert D. Burnham, Los Altos Hills, all of Calif., assignors to Xerox Corporation, Stamford, Conn.

Filed Oct. 30, 1978, Ser. No. 956,307
Int. Cl.[3] H01S 3/19
U.S. Cl. 331—94.5 H 53 Claims



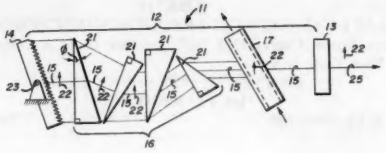
1. In a monolithic laser device wherein one or more layers of semiconductor material are fabricated on a substrate, one of said layers forming an active layer for light wave propagation and generation under lasing conditions, means for forward biasing said active layer to produce a plurality of adjacent light propagating and emitting portions therein, light guiding regions in said device nonlinear relative to said emitting portions whereby said light waves produced in one portion of said active layer are deflected and coupled into one or more adjacent emitting portions of said active layer, said regions provided by a refractive index change with which said light wave interacts while said light wave is within said regions and wherein said refractive index change is provided by the injected charge distribution determined by current confining means.

4,255,718

TRANSVERSELY PUMPED DYE LASER HAVING IMPROVED CONVERSION EFFICIENCY

Richard L. Herbst, Menlo Park, Calif., assignor to Quanta-Ray, Inc., Mountain View, Calif.

Continuation-in-part of Ser. No. 859,007, Dec. 9, 1977. This application May 22, 1978, Ser. No. 908,380
Int. Cl.[3] H01S 3/20
U.S. Cl. 331—94.5 L 9 Claims



1. In a method for transversely pumping a dye laser gain medium the steps of:
providing a beam of electrically polarized optical wave radiation to be amplified in a dye laser gain medium; and
directing electrically polarized pumping optical wave radiation into the dye laser gain medium with the angular divergence of the Poynting vector of the pumping wave radiation being not less than 45° from the Poynting vector or the reciprocal thereof of the optical wave radiation being amplified in the dye laser gain medium, and with the angular divergence of the electric polarization vector of the pumping wave radiation being not greater than 45° from the electric polarization vector
or the reciprocal thereof of the optical wave radiation which is being amplified in the dye laser gain medium, whereby the efficiency of conversion of pump energy into amplified optical wave radiation energy is enhanced for such a transversely pumped dye laser gain medium.

4,255,719

MAINTENANCE OF OPTIMAL ORIENTATION IN F_2^+ COLOR CENTER LASERS

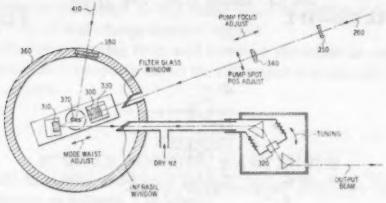
David M. Bloom, Menlo Park, Calif., and Linn F. Mollenauer, Colts Neck, N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed May 30, 1979, Ser. No. 43,728
Int. Cl.[3] H01S 3/16
U.S. Cl. 331—94.5 F 19 Claims

1. An F_2^+ color center laser which comprises:
an optical resonant laser laser cavity delimited by energy abstracting means;
an alkali halide crystal having F_2^+ color centers aligned along a preferred direction, said crystal being disposed within said cavity;
a first source for providing radiation which produces a population inversion in said F_2^+ color centers, said radition having a polarization along said preferred direction; and
means for applying said radiation to said F_2^+ color centers;

characterized in that

said laser further includes at least one other source of radiation having a polarization component which is substantially perpendicular to said preferred direction and having photon energies lower than that required for a single



photon to discharge electrons from defects other than the F_2^+ color centers in said alkali halide crystal;

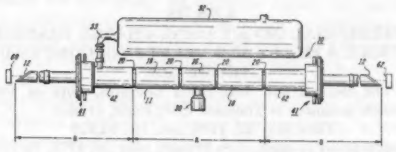
means for applying said radiation further includes means for applying the radiation from said at least one other source to said alkali halide crystal;

4,255,720

VARIABLE DIAMETER SEGMENTED HOLLOW CATHODE LASER DEVICE

Shing C. Wang, Temple City, and Randolph W. Hamerdinger, Glendora, both of Calif., assignors to Xerox Corporation, Stamford, Conn.

Filed Oct. 2, 1978, Ser. No. 947,384
Int. Cl.³ H01S *3/03*
U.S. Cl. 331—94.5 G **17 Claims**



1. A laser device for producing an output laser beam having a plurality of wavelengths comprising:

an envelope having a longitudinal axis,

an anode electrode forming a portion of said envelope, said anode electrode being coaxially disposed with respect to said longitudinal axis, at least two separate hollow cathodes located within said envelope, said first and second hollow cathodes being coaxially disposed with respect to said longitudinal axis, the inner diameter of said first hollow-cathode being different than the inner diameter of said second hollow cathode to optimize the laser output power extracted for each wavelength produced in the output beam,

said first and second hollow cathodes each having a portion thereof coupled to said envelope whereby the heat generated therein is dissipated to the external environment,

coaxially aligned mirror end members, said mirror end members sealing said envelope thereby providing a resonant cavity and a structure for confining a gaseous medium therein,

means for supplying an active gaseous medium having an absorption band such that it will lase at wavelengths supported by said resonant cavity in said envelope, and

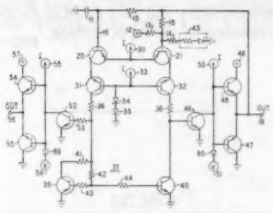
means for applying a voltage between said anode electrode and said first and second hollow-cathodes whereby a discharge between said cathodes and said anode electrode is created causing said gaseous medium to lase, a laser output beam having a plurality of wavelengths thereby being produced, said output beam being abstracted from one of said mirror end members.

4,255,721

TEMPERATURE COMPENSATED INTEGRATABLE RC OSCILLATOR

Thomas G. Wilson, Jr., Morristown, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Dec. 29, 1978, Ser. No. 974,383
Int. Cl.³ H03K *3/295*
U.S. Cl. 331—111 **10 Claims**



1. A frequency stabilized oscillator for producing a square wave output and using only resistance and capacitance frequency-determining elements

CHARACTERIZED BY

a constant voltage source,

a constant current supply,

an output stage comprising at least one transistor providing said output at its emitter electrode and receiving an oscillatory input signal,

means for clamping the base of said transistor to said constant voltage source and biasing said base from said constant current supply so as to maintain the emitter voltage of said transistor constant during one half-cycle of each oscillation, and

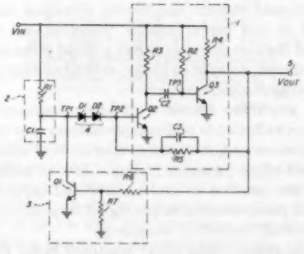
means for clamping said emitter to a voltage with a fixed offset from ground potential during the other half-cycle of each oscillation.

4,255,722

VOLTAGE CONTROLLED MULTIVIBRATOR HAVING VARIABLE FREQUENCY AND DUTY CYCLE

Paul E. Hochstrate, Bristol, Conn., assignor to Timex Corporation, Waterbury, Conn.

Filed Aug. 23, 1979, Ser. No. 69,159
Int. Cl.³ H03K *3/282*
U.S. Cl. 331—113 R **11 Claims**



1. A voltage controlled oscillator circuit of the type having an astable multivibrator coupled between two voltage terminals for providing output pulses having a periodicity which

varies as a function of the input voltage applied across the voltage terminals, wherein the improvement comprises:

said astable multivibrator having a first timing network connected between first and second transistors and being responsive to the amplitude of the input voltage, and a first feedback circuit connected between an output terminal of said second transistor and an input trigger terminal of said first transistor for controlling the pulse width of said output pulses; and

means having a second timing network connected to said input trigger terminal and being responsive to the amplitude of the input voltage and the output pulses for controlling the period between the output pulses;

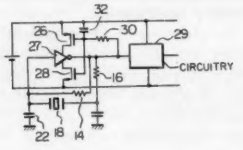
whereby the periodicity and duty cycle of the output pulses vary as a function of the input voltage.

4,255,723

AMPLITUDE CONTROL INVERTER CIRCUIT FOR ELECTRONIC DEVICE

Heihachiro Ebihara, Tokorozawa, Japan, assignor to Citizen Watch Co. Ltd., Tokyo, Japan

Filed May 22, 1978, Ser. No. 908,305
Claims priority, application Japan, May 26, 1977, 52/61666
Int. Cl.³ H03B *5/36*
U.S. Cl. 331—116 FE **6 Claims**



4. An amplitude control inverter for an electronic device having a power source and a signal source, comprising:

a complementary pair of field effect transistors having gate electrodes connected to said signal source and with the drain electrodes of said complementary pair of field effect transistors connected together;

a resistor having a first terminal connected to the junction of said drain electrodes of the complementary pair of field effect transistors to receive an output signal generated therefrom;

a capacitor having a first terminal connected to a second terminal of said resistor and having a second terminal connected to said power source, whereby said output signal from the complementary pair of field effect transistors is produced, delayed in phase, at the junction of said resistor and said capacitor; and

at least one amplitude control field effect transistor connected in series between said complementary pair of field effect transistors and said power source, said amplitude control field effect transistor having a gate terminal connected to the junction of said resistor and capacitor to receive said phase-delayed output signal from the complementary pair of field effect transistors;

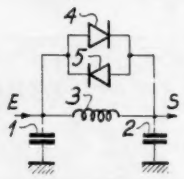
said amplitude control field effect transistor being responsive to said phase-delayed output signal for controlling a duration of a current which flows in said complementary pair of field effect transistors as a result of a change in potential of a signal generated by said signal source.

4,255,724

DISTORTION-CORRECTOR FOR MICROWAVE TUBES

Jean-Pierre Bergero, Paris, France, assignor to Thomson-CSF, Paris, France

Filed Nov. 29, 1978, Ser. No. 964,663
Claims priority, application France, Dec. 2, 1977, 77 36331
Int. Cl.³ H03H *7/20, 7/34, 21/00*
U.S. Cl. 333—17 L **7 Claims**



1. Distortion-corrector for microwave tubes which comprises:

a filter of the low-pass type, having an input and an output;

two diodes connected in parallel opposition, said two diodes being disposed between the input and output of the filter;

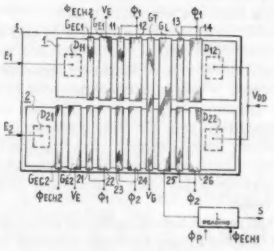
this corrector compensating amplitude- and phase-distortions of the tube associated with the corrector, over a given operational frequency-band of the tube which is below the cut-off frequency of the filter, by compressing weak signals, for which no diode conducts, with respect to strong signals, for which there is at least a start of conduction of one of the diode, and by producing a phase-lead which increases with the input power of the filter.

4,255,725

DIFFERENTIAL DEVICE USING CHARGE TRANSFER DEVICES, A FILTER AND DELAY LINE COMPRISING THIS DEVICE

Jean-Luc Berger, and Jean-Louis Coutures, both of Paris, France, assignors to Thomson-CSF, Paris, France

Filed May 23, 1979, Ser. No. 41,829
Claims priority, application France, May 26, 1978, 78 15797
Int. Cl.³ H03H *15/02, 7/30;* **G11C** *27/00*
U.S. Cl. 333—165 **14 Claims**



1. A differential device using charge-transfer devices for forming the difference between two electrical input signals, comprising:

a semi-conductor substrate in which electrical charges are capable of being transferred;

at least two electrically insulated channels formed in said substrate which respectively receive said two input signals;

first means for forming at the same instants in each of the channels groups of electrical charges representing samples of said input signals;

at least one electrode common to said two channels;

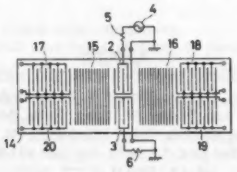
second means comprising transfer electrodes deposited on said substrate substantially parallel to one another, to which are applied periodic charge-transfer signals (ϕ_1, ϕ_2) controlling said transfer of charges, said second means propagating said groups of charges in each of said channels towards said common electrode with a relative delay from one channel to the other equal to half the period (T/2) of said charge-transfer signals;

means for extracting from said common electrode an output signal which is proportional to the difference between the two input signals.

4,255,726
SURFACE ACOUSTIC WAVE FILTER

Yasuaki Kinoshita, and Toyoji Tabuchi, both of Hachioji, Japan, assignors to Hitachi, Ltd., Japan

Filed Mar. 7, 1979, Ser. No. 18,331
Claims priority, application Japan, Mar. 20, 1978, 53-34584[U]
Int. Cl.³ H03H *9/64*; H01L *41/18*
U.S. Cl. 333—195 **5 Claims**

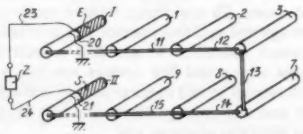


1. A surface acoustic wave filter comprising a transmitting transducer for converting the electrical signals into surface waves, a receiving transducer for converting the surface waves into electrical signals, reflecting transducers disposed on both sides of said transmitting and receiving transducers, and coupling transducers disposed between said transmitting and receiving transducers and said reflecting transducers, which are all arrayed on a surface of a piezo-electric substrate, wherein said coupling transducers work as 3-dB directional couplers.

4,255,727
ELECTROMECHANICAL FILTERS

Herbert Ernyei, and Etienne Langlois, both of Paris, France, assignors to Societe Lignes Telegraphiques et Telephoniques, Ste. Honorine, France

Filed Jun. 28, 1978, Ser. No. 920,115
Claims priority, application France, Aug. 4, 1977, 77 23983
Int. Cl.³ H03H *9/46, 9/50, 9/52*
U.S. Cl. 333—197 **4 Claims**



1. An electromechanical multi-resonator filter comprising:

a set of mechanical resonators interconnected by mechanical couplers;

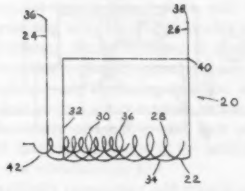
two transducers, each including one piezoelectric wafer loacted between two tuning rods to constitute two resonators of said set each of which are mechanically coupled to only one other resonator of the set, respectively, one end surface of each of said wafers being electrically connected to a reference potential and the other end surface of each of said wafers being electrically connected to a lead acting as a terminal for said filter; and

an electrical reactance connected between said filter terminals, the mechanical equivalent of said reactance corresponding to a mechanical circuit which behaves as an odd number of quarter wavelengths of the mechanical wave in said resonators.

4,255,728
PARALLEL RESONANT ELECTRIC CIRCUIT

Archibald C. Doty, Jr., 8360 Rushton Rd., South Lyon, Mich. 48178

Filed Aug. 24, 1978, Ser. No. 936,389
Int. Cl.³ H03H *5/00*; H03J *3/10, 3/20, 3/22*
U.S. Cl. 333—219 **2 Claims**

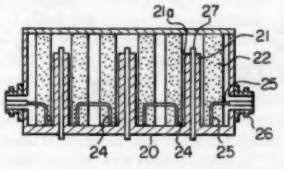


1. A parallel resonant circuit having only coils and being resonant at a predetermined frequency comprising a first coil having a plurality of convolutions and opposite ends, a second electrical coil extending concentrically with the first electrical coil and having a plurality of convolutions and opposite ends, the convolutions of the second coil separating the convolutions of the first coil and one end of the second coil being connected to the opposite end of the first coil and a third coil having a plurality of convolutions inserted within the first and second coils for axial movement therein to tune the resonant frequency of the parallel resonant electric circuit.

4,255,729
HIGH FREQUENCY FILTER

Atsushi Fukasawa; Jun Ashiwa, and Takuro Sato, all of Tokyo, Japan, assignors to Oki Electric Industry Co., Ltd., Tokyo, Japan

Filed May 9, 1979, Ser. No. 37,419
Claims priority, application Japan, May 13, 1978, 53-56160; May 29, 1978, 53-63360; Jan. 25, 1979, 54-7145[U]
Int. Cl.³ H01P *1/201, 7/00*
U.S. Cl. 333—202 **11 Claims**



1. A high frequency filter comprising a conductive housing, at least two resonators fixed in said housing, an input means for coupling one end resonator of said at least two resonators to an external circuit, an output means for coupling the other end resonator of said at least two resonators to an external circuit, and coupling means for electromagnetically coupling each resonator, characterized in that each resonator comprises an inner conductor one end of which is fixed at the bottom of said housing, and the other end of which is free standing, wherein the length of said inner conductor is substantially $\frac{1}{4}$ wavelength, a cylindrical dielectric body surrounding said inner

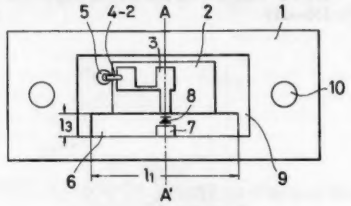
conductor, the thickness of said dielectric body being sufficient to hold substantially all the electromagnetic energy in the dielectric body, wherein electromagnetic energy is applied to said filter through said input means, and exits therefrom through said output means.

4,255,730

MICROWAVE INTEGRATED CIRCUIT DEVICE

Kenji Sekine, Hinodemachi, and Yoichi Kaneko, Tokorozawa, both of Japan, assignors to Hitachi, Ltd., Japan

Filed Oct. 24, 1978, Ser. No. 954,118
Int. Cl.[3] H01P *5/00;* **G01S** *13/00;* **H04B** *1/40;* **H03D** *9/02*
U.S. Cl. 333—247 **2 Claims**



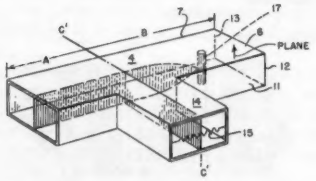
1. A microwave device having a rectangular waveguide having an end wall closed by a short circuit plane and a microwave integrated circuit (MIC) formed on a substrate for detecting a low frequency signal from a diode installed in the waveguide, characterized in that said substrate is mounted on the inner surface of said end wall, said diode is mounted on said substrate and connected to said microwave integrated circuit (MIC), and a groove having a rectangular opening of which a larger side is parallel with the longer wall of the rectangular waveguide and is of length at least $\frac{1}{4}\lambda_g$, wherein λ_g is wavelength in the waveguide, said diode being mounted across the smaller dimension of said groove.

4,255,731

INTENSE ELECTRON BEAM MICROWAVE SWITCH

Daniel L. Birx, Pasadena, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Sep. 24, 1979, Ser. No. 78,251
Int. Cl.[3] H01P *1/14*
U.S. Cl. 333—258 **12 Claims**



1. Microwave switch apparatus comprising:

a waveguide formed of wall members providing a cavity having a continuously elongate main extent formed by first and second arm sections and a branch arm joined in open communication with said first and second sections at their junctures,

said second arm section having at its distal end a short circuit member for reflecting incident microwave energy radiations in a standing wave pattern capable of controlling said branch arm coupling,

means for generating electromagnet microwave energy radiations in said cavity,

a high voltage power supply, and

transmission means driven by said high voltage supply for controllably generating within said second arm section a beam of electrons extending transversely of its cavity essentially parallel to the electrical field of said generated radiations, said beam being of sufficient density to reflect said component and form a standing wave interference pattern having nodes and antinodes disposed at fixed positions in said main cavity extent relative to said branch arm juncture,

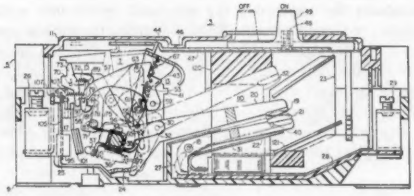
said transverse location of said electron beam relative to said juncture being such that the electrical field intensity of said standing wave interference pattern at said juncture controls the coupling of said microwave energy into said branch arm whereby said coupling is switchably responsive to said electron beam.

4,255,732

CURRENT LIMITING CIRCUIT BREAKER

John A. Wafer, Beaver; Walter V. Bratkowski, McKeesport, both of Pa., and Walter W. Lang, Rolla, Mo., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Oct. 16, 1978, Ser. No. 951,941
Int. Cl.[3] H01H *75/00, 77/00*
U.S. Cl. 335—16 **19 Claims**



1. A current limiting circuit interrupter, comprising:

a housing;

separable contacts disposed in said housing;

an operating mechanism comprising a pivoting carriage and means adapted for manual operation to pivot said carriage between open and closed positions;

contact support means comprising first and second pivoting contact arms each supporting one of said contacts, said first contact arm being pivotally attached to said carriage, and means for restricting relative motion between said carriage and said first contact arm to rotation;

bias means connected to said first contact arm, said bias means urging said first contact arm into a first position with respect to said carriage so that said attached contact arm and said carriage rotate as a unit to open and close said separable contacts; and

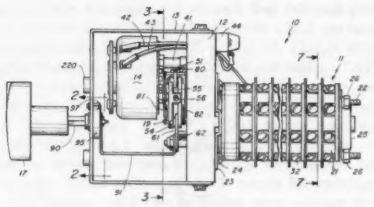
means connected to said contact arms for causing circuit current to flow through said contacts and through said contact arms in opposite directions when said carriage is in the closed position

and for generating electrodynamic force urging said contacts apart to cause said contact arms to rapidly pivot in opposite directions to separate said contacts and provide current limiting action, said first contact arm pivoting independently with respect to said carriage against the action of said bias means to a second position.

4,255,733
LATCHING SWITCH RELAY

Alexander MacLean, Hingham, Mass., assignor to Electro Switch Corp., Weymouth, Mass.

Filed Jan. 30, 1978, Ser. No. 873,431
Int. Cl.[3] H01H 3/00
U.S. Cl. 335—190 16 Claims



1. A latching switch relay capable of manual and remote electrical actuation of a switch shaft to cause switching of contacts,

said latching switch relay comprising,

said switch shaft carrying a plurality of electrical contacts and having a first switch position and a second switch position,

means mounting said shaft for reciprocal rotation about an axis of said shaft,

spring means for urging said contact carrying shaft into said first position and resiliently maintaining said shaft in said first position, said spring means further acting to alternately urge said shaft into said second position and resiliently maintain said shaft in said second position.

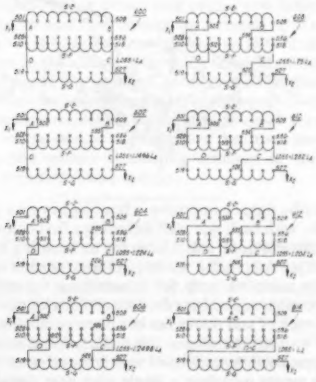
a rotary solenoid for causing movement of said shaft from said first to said second position and vice versa,

said rotary solenoid carrying a drive link for translating unidirectional driving torque of said solenoid into mechanical power to alternately move said shaft clockwise to said second position and counterclockwise to said first position.

4,255,734
TRANSFORMER WITH TAPPED SUBWINDINGS

Donald W. Owen, 344 Foreman Ave., Norman, Okla. 73069

Filed Apr. 3, 1978, Ser. No. 892,939
Int. Cl.[3] H01F 21/12
U.S. Cl. 336—147 1 Claim



1. A transformer comprising:

a first electrical winding;

three physically spaced inductive subwindings, each having a plurality of first through n+1 section outputs connected thereto so that each consecutive pair of outputs defines first through n winding sections;

means for inductively linking said first winding with said three subwindings;

a first tandem switch, including:

a first plurality of first through n+1 selectively connectable contacts, each of said first plurality of contacts being connected to a respective one of the first through n+1 section outputs of a first one of said three inductive subwindings;

a second plurality of first through n+1 selectively connectable contacts, each of said second plurality of contacts being connected to a respective one of the first through n+1 section outputs of a second one of said three inductive subwindings;

first wiper contact means mounted in said first tandem switch for coacting with said first plurality of contacts;

second wiper contact means mounted in said first tandem switch for coacting with said second plurality of contacts;

means for synchronously operating said first wiper contact means and said second wiper contact means;

means for electrically connecting said first wiper contact means to the first section output of the second one of said three inductive subwindings; and

means for electrically connecting said second wiper contact means to the n+1 section output of the first one of said three inductive subwindings;

a second tandem switch, including:

a third plurality of first through n+1 selectively connectable contacts, each of said third plurality of contacts being connected to a respective one of the first through n+1 section outputs of the second one of said three inductive subwindings;

a fourth plurality of first through n+1 selectively connectable contacts, each of said fourth plurality of contacts being connected to a respective one of the first through n+1 section outputs of a third one of said three inductive subwindings;

third wiper contact means mounted in said second tandem switch for coacting with said third plurality of contacts;

fourth wiper contact means mounted in said second tandem switch for coacting with said fourth plurality of contacts;

means for synchronously operating said third wiper contact means and said fourth wiper contact means;

means for electrically connecting said third wiper contact means to the first section output of the third one of said three inductive subwindings; and

means for electrically connecting said fourth wiper contact means to the n+1 section output of the second one of said three inductive subwindings; and

output means for providing a voltage discretely variable from a first voltage to a second voltage three times greater than said first voltage as said first, second, third and fourth wiper contact means are moved from a synchronized first position relative to said pluralities of selectively connectable contacts wherein said three inductive subwindings are in total parallel to a synchronized n+1 position relative to said pluralities of selectively connectable contacts wherein said three inductive subwindings are in total series, said output means including a single pair of output terminals comprising:

a first output terminal connected to the first section output of the first one of said three inductive subwindings; and

a second output terminal connected to the n+1 section output of the third one of said three inductive subwindings, which n+1 section output is the section output farthest from the section output to which said first output terminal is connected.

4,255,735

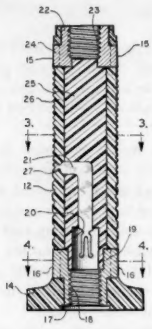
PRECISION INJECTION-MOLDED COIL FORM

James P. Liautaud, River and Bluff Rds., Trout Valley, Cary, Ill. 60013

Continuation of Ser. No. 766,388, Feb. 7, 1977, abandoned, which is a continuation of Ser. No. 639,421, Dec. 10, 1975, abandoned. This application Dec. 15, 1977, Ser. No. 860,872

Int. Cl.³ H01F *15/10, 27/30*

U.S. Cl. 336—192 **3 Claims**



1. A precision inductance winding assembly comprising, in combination:

a generally cylindrical core member having an axially-extending circumferential surface and a shank portion of reduced diameter at one end;

an electrical conductor formed into an inductance winding configuration having a diameter overall slightly greater than the diameter of said core member;

annular positioning means for said electrical conductor including a layer of dielectric material permanently molded in support-receiving relationship on the surface of said core member and extending into engagement with said conductor for maintaining said electrical conductor in said inductance winding configuration; and

mounting means including a one-piece electrically-conductive end fitting having a radially-extending contact portion electrically connected to said conductor and an axially-extending mounting portion for attachment to an external member, said contact portion being discontinuous about the circumference of said fitting to form a plurality of radially-extending tab portions, and said end fitting being fitted over said shank portion with said contact portion at least partially embedded in said positioning layer and said positioning layer extending between said tab portions to secure said fitting in abutting relationship to said core member.

4,255,736

THERMAL PROTECTIVE SWITCH

John R. Kelley, and Harold G. Wyse, both of 3629 N. Dixie Dr., Dayton, Ohio 45414

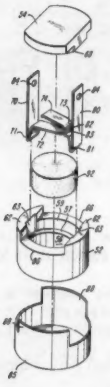
Continuation-in-part of Ser. No. 792,530, May 2, 1977, Pat. No. 4,135,177. This application Jan. 15, 1979, Ser. No. 3,256

The portion of the term of this patent subsequent to Jan. 16, 1996, has been disclaimed.

Int. Cl.³ H01H *37/60, 37/76*

U.S. Cl. 337—407 **18 Claims**

1. A thermal switch comprising a housing, a set of elongated first and second conductors having corresponding inner portions disposed within said housing, a contact element disposed within said housing and connected to said inner portion of said first conductor, said contact element extending towards said inner portion of said second conductor and having a contact portion engaging a contact surface of said inner portion of said second conductor at a location spaced on one side of a reference plane when said contact element is in a conducting position, said inner portion of said second conductor projecting from said contact surface towards said inner portion of said first conductor to form a restriction to the movement of said contact element at said reference plane, a thermal sensing element disposed within said housing for normally retaining said contact element in said conducting position, said thermal sensing element being capable of changing from a rigid state to a melted state in response to being heated to a predetermined



temperature, spring means associated with said contact element for urging said contact element from said conducting position to an interrupted position on the other side of said reference plane in response to changing of said thermal sensing element to said melted state, and said contact element passes transversely through said reference plane when moving from said conducting position to said interrupted position to effect snap-action movement of said contact element.

4,255,737

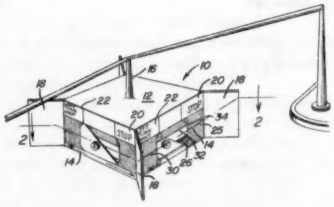
TRAFFIC SIGNAL WITH TIME DURATION INDICATOR AND MECHANICAL SYNCHRONIZATION

Robert F. Casteel, 103 Sunrise La. Rte. 2, Box S 28, Mission, Tex. 78572

Filed Apr. 23, 1979, Ser. No. 32,667

Int. Cl.³ G08G *1/096, 1/095*

U.S. Cl. 340—43 **4 Claims**



1. A traffic signal comprising: a housing having a plurality of side walls, with each side wall including a first colored portion operatively related to a first lamp for transmitting the color of said first portion; and a second colored portion operatively related to a second lamp for transmitting the color of said second portion; a plurality of substantially semi-circular masks wherein each of said masks lies in a plane parallel to its respective said wall and rotating in that plane for sequentially covering and uncovering sections of said first and second portions;

timing means including a single ring gear disposed within said housing and rotating therein for providing a synchronized mechanical linkage between said masks, wherein each of said masks includes a shaft fixedly attached thereto for causing rotation of said masks with each shaft includ-

ing a driving gear fixedly attached to the shaft and operatively engaged with said ring gear, one of said shafts including drive means operatively engaged with a motor for causing rotation of said shaft and said ring gear; further wherein said first colored portion of each side wall includes an extension which is disposed laterally of said side wall and said second colored portion includes an extension which is disposed laterally of said side wall and vertically spaced from the extension of said first colored portion, said extensions comprising the sections which are covered and uncovered by said mask; a "LEFT TURN ONLY" signal means included in each of said side walls; a "STOP" signal means included in each of said side walls, switch means for selectively energizing either said first and second lamps or said "STOP" signal means, said switch means comprising a cam carried by said ring gear, a two position switch mounted stationarily with respect to said ring gear, and a switch actuator means for moving said switch between said two positions upon contact by said cam.

4,255,738

DEVICE FOR DETECTING UNWANTED SIGNAL COMBINATIONS OF TWO SIGNAL LAMPS IN TRAFFIC LIGHTS

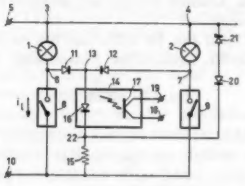
Nicolaas Van Tol, Hilversum, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Dec. 14, 1978, Ser. No. 969,524

Claims priority, application Netherlands, Jan. 2, 1978, 7800004

Int. Cl.³ G08G *1/097*; B60Q *9/00*

U.S. Cl. 340—46 **10 Claims**



1. A device for detecting unwanted signal combinations in a traffic light system comprising, first and second connecting terminals of an electric supply source, first and second traffic signal lamps each having first and second terminals, first and second switches, means connecting each signal lamp via the first terminal to said first connecting terminal of the supply source and via the second terminal and an individual one of said switches to the second connecting terminal of the supply source, two oppositely arranged series connected diodes connected between the second terminals of the signal lamps, and a detection device connected to a junction point formed between the interconnected terminals of the two diodes and coupled to the second connecting terminal of the supply source via a source of bias voltage.

4,255,739

DEVICE FOR THE INDICATION OF DIFFERENT OPERATING CONDITIONS OF MOTOR VEHICLES

Wilhelm-Ludwig Lang, Altheim, Fed. Rep. of Germany, assignor to VDO Adolf Schindling AG, Frankfurt am Main, Fed. Rep. of Germany

Filed Jun. 29, 1979, Ser. No. 53,600

Claims priority, application Fed. Rep. of Germany, Jul. 3, 1978, 2829126

Int. Cl.³ B60Q *1/00*

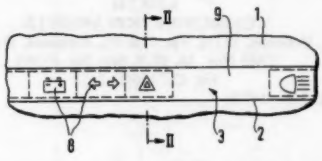
U.S. Cl. 340—52 F **8 Claims**

1. A device for the indication of different operating conditions of motor vehicles, particularly automobiles, comprising

a number of light sources which are coordinated to individual operating conditions,

a corresponding number of separate focusing hoods receiving the light sources, respectively, the focusing hoods being arranged in a longitudinal row adajcent to one another and having front sides,

an inspection glass covering the focusing hoods on the front sides thereof constituting an end which faces the observer,



a thin flexible longitudinally elongated strip printed with symbols, the strip being insertable between the focusing hoods and the inspection glass, the strip being in translucent to light at least in the area of the symbols,

said strip forming elevations engraved into the strip, said elevations projecting against the inspection glass and constituting means for pressing the strip on the front sides of the focusing hoods.

4,255,740

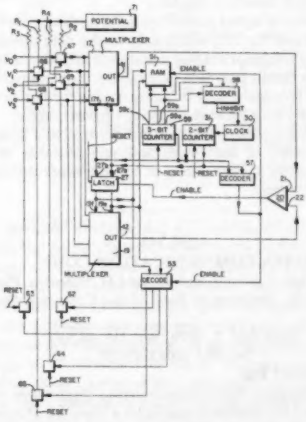
SYSTEMS FOR COMPARING AND RANKING A PLURALITY OF SIGNAL INPUTS

Ronald G. Ferrie, Pittsburgh, Pa., assignor to RCA Corporation, New York, N.Y.

Division of Ser. No. 845,213, Oct. 25, 1977, Pat. No. 4,214,213. This application Jun. 18, 1979, Ser. No. 49,596

Int. Cl.³ G06F *7/02*; H04B *1/06*

U.S. Cl. 340—146.2 **7 Claims**



1. A system for comparing a plurality of analog signal inputs and for ranking said signal inputs according to their quality comprising:

a comparator,

means for sequentially coupling substantially without delay therebetween each of said analog input signals to a first input of said comparator,

means for providing a reference signal level to a second input of said comparator, said comparator responsive to said signals for providing a control signal each time the level of said first input indicates a higher quality signal level than that represented at the second input,

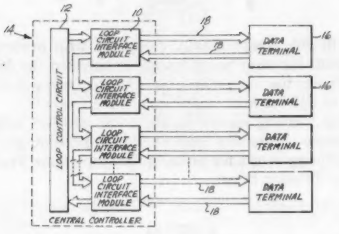
means responsive to said control signal providing a binary signal representing the highest quality signal compared, and

means responsive to the binary signal at the termination of each complete scan or coupling of all of said signal inputs to said comparator for sequentially digitally storing the same and preventing said stored binary signal from being further stored.

4,255,741
COMMUNICATION MODULE

Erik R. Peterson, 11711 NE. 67th Pl., Kirkland, Wash. 98033

Filed Nov. 26, 1979, Ser. No. 97,401
Int. Cl.³ H04B *1/58*
U.S. Cl. 340—147 R **21 Claims**



1. A loop circuit interface module enabling a plurality of data terminals remote from each other and from a central loop controller to communicate with each other and the central controller over a plurality of data channels interconnecting same, the said loop circuit interface module comprising:

(a) a plurality of data ports for inputting data from either the loop controller or another loop circuit interface module, and for outputting data to the loop controller or another loop circuit interface module;

(b) a plurality of signal ports for inputting data from the data terminal and for outputting data to the data terminal;

(c) bridging means providing a matched impedance between said loop circuit interface module, the loop controller, and the data terminals, said bridging means further providing gain to the data on said plurality of ports; and,

(d) switching means selectively and controllably connecting said plurality of data ports and said plurality of signal ports directly to each other, or to each other through said bridging means.

4,255,742
DATA COMMUNICATION CODE

Melvin G. Gable, Ypsilanti, and Richard H. Sherman, Plymouth, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

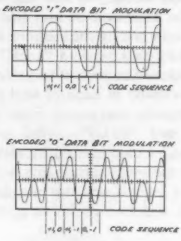
Filed Jun. 7, 1979, Ser. No. 46,517
Int. Cl.² H03K *13/24*
U.S. Cl. 340—347 DD **2 Claims**

1. A synchronous data communication transceiver coupled to a communication medium shared by a plurality of other such transceivers and associated with an encoder means for converting a binary input data information code into a ternary output data code capable of supplying timing information, having an average signal value of zero to facilitate AC coupling, and each ternary code sequence having an equal total power transmitted, said encoder means including:

an input means for receiving binary information in either a first binary state or a second binary state;

oscillator means for supplying a clock rate which is six times the input rate of the first and second binary states for use in the generation of the ternary code;

generating means coupled to said input means and said oscillator means for supplying a first and a second pulse train in response to each of the first and second binary input states for use as components in the generating of the ternary code to that in response to the first binary input state said generating means produces a first pulse train of 1, 1, 0, 0, 0, 0 and a second pulse train of 0, 0, 0, 0, 1, 1 and in response to the second binary input state said generating



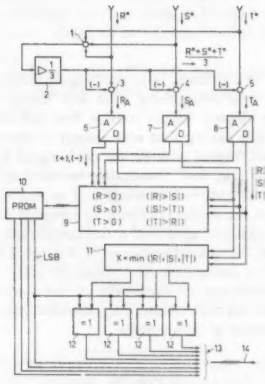
means produces a first pulse train of 1, 0, 1, 0, 0, 0 and a second pulse train of 0, 0, 0, 1, 0, 1; and

processing means coupled to said generating means for combining the first and second pulse trains so that the ternary code is generated for encoding one binary input data information with +1, +1. 0, 0, −1, −1, and the other binary input data information with +1, 0, +1, −1, 0, −1.

4,255,743
METHOD FOR DIGITAL INTERPOLATION OF A PERIOD OF A THREE-PHASE ANALOG SIGNAL

Albert Guenin, Arisdorf, Switzerland, assignor to Contraves AG, Zürich, Switzerland

Filed Jun. 18, 1979, Ser. No. 49,577
Claims priority, application Switzerland, Jun. 26, 1978, 6929/78
Int. Cl.³ H03K *13/02*
U.S. Cl. 340—347 SY **4 Claims**



1. In a method for the digital interpolation of a period of a three-phase analog signal, the components (phases) of which constitute a periodic function of a measured quantity, especially the position during a linear or angular measurement, wherein the values of the components are compared with zero and each two thereof are compared with one another, each possible combination of the comparison results being correlated with a phase zone defined within the range of possible phase argument values of the analog signal, and the value of each of the components is analog-digital converted, the improvement comprising the steps of:

determining from the analog- digital converted values (R,S,T) of all three components the respective value having the smallest absolute value (X), the intermediate absolute value (Y) and the largest absolute value (Z);

forming two digital auxiliary values (H,K) corresponding to the functions $H=Y-X$ and $K=Z-Y+X$;

constructing an allocation table assigning a predetermined step designation number to each possible combination of such auxiliary values, the total number of possible steps being 2^n, wherein n is an integer, the step designation number being an integer having a value varying from zero to 2^n-1 when the phase argument traverses one complete phase zone;

determining from the analog-digital converted values (R,S,T) of all three components the result of fulfillment decisions relative to the inequalities $|R|>|S|$, $|S|>|T|$,$|T|>|R|$, and the result of a fulfillment decision relative to a selected one of the three inequalities $|R|>|0|$, $|S|>|0|$, and $|T|>||$;

constructing an allocation table assigning a predetermined phase zone designation number to each possible combination of such results of the fulfillment decisions, the total number of phase zones being twelve, the phase zone desination number being an integer having a value varying from zero to eleven when the phase argument traverses one complete period;

the step designation number "zero" and the phase zone designation "zero" being assigned to the respective step and phase zone attained when the value of the variable appearing in said selected one inequality infinitesimally increases from zero;

expressing the value of the phase zone designation number and of the step designation number in the binary numeration system, the phase zone desination number thus having four bits and ranging from 0000 to 1011 and the step designation number thus having n-bits and ranging from the n-bit number having all bits equal to 0 to the n-bit number having all bits equal to 1;

forming an auxiliary binary number which is equal to the binary step designation number when the least- significant bit of the binary zone designation number is 0 which is equal to the complement of the binary step designation number when the least-significant bit of the binary zone number is 1 ; and

combining the binary zone designation number with the auxiliary binary number to form a binary period interpolation number having n+4 bits of which the four highest -significant bits consist of the binary zone designation number and of which the n-lowest-significant bits consist of the auxiliary binary number.

4,255,744

HIGHWAY CROSSING BELL APPARATUS

Charles T. Link, Pleasant Hills, Pa., assignor to American Standard Inc., Swissvale, Pa.

Filed Jun. 11, 1979, Ser. No. 47,532
Int. Cl.³ G10K *1/065*
U.S. Cl. 340—399 **4 Claims**

1. Bell apparatus comprising,

(a) a circular gong for sounding a signal when struck,

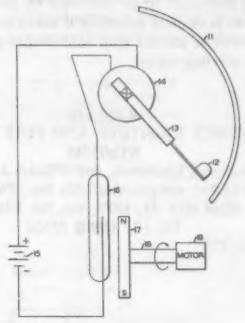
(b) a clapper means,

(c) an operating means connected for rotating said clapper means to strike said gong when said operating means is actuated,

(d) a reed relay switch having an enclosed pair of contacts coupled for actuating said operating means when closed.

(e) a motor operable when selectively activated for rotating its shaft, and

(f) a permanent magnet mounted on said motor shaft and positioned in proximity to said reed relay for repeatedly



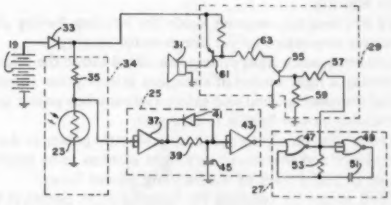
actuating closure of said pair of contacts when said magnet is rotated by operation of said motor.

4,255,745

APPARATUS FOR AUDIBLE ALTERING OF ENCLOSURE OPENING

Joseph J. Rohan, 841 Amolac, St. Louis County, Mo. 63141, and Gregory W. Kuehl, 4079 Calvera, St. Louis County, Mo. 63134

Continuation-in-part of Ser. No. 785,309, Apr. 6, 1977, Pat. No. 4,155,077. This application Apr. 18, 1979, Ser. No. 31,051
The portion of the term of this patent subsequent to May 15, 1996, has been disclaimed.
Int. Cl.³ G08B *13/08*
U.S. Cl. 340—546 **12 Claims**



1. A portable miniaturized self-contained audible alerting apparatus for being placed in a normally darkened enclosure for audibly alerting a person outside of and a distance from said enclosure that said enclosure is opened, said apparatus comprising a small case having a light-receiving aperture, photodetector means within said case and positioned with respect to said aperture for detecting light received by said aperture and providing an electronic first signal in response to detected light, time delay means within said case, an oscillator controlled by said time delay means for providing a time-delayed electronic second signal of audible character in response to said first signal after a predetermined period following the providing of said first signal by said photodetector means continuously for said predetermined period, frequency control means within said case for causing said audible second signal to change repeatedly between upper and lower frequency limits, amplifier means within said case for effectively amplifying said time-delayed electronic second signal, and transducer means within said case for converting said electronic second signal to an audible alerting signal of sufficient loudness for being heard by said person outside of and at a distance from said enclosure, said case including within it a battery for powering said time delay means, said oscillator, said frequency control means, said

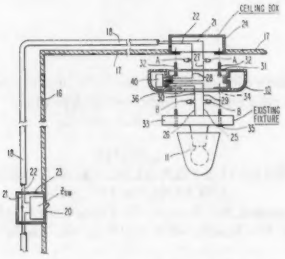
amplifier means, and said transducer means, said case being positionable within said enclosure for permitting light from outside said enclosure to be received by said aperture when said enclosure is opened whereby if said enclosure is opened, said person will be alerted after said predetermined period by said audible alerting signal.

4,255,746

EMERGENCY LIGHTING AND FIRE DETECTOR SYSTEM

Robert W. Johnson, Levittown, and William J. Raddi, Philadelphia, both of Pa., assignors to ESB Inc., Philadelphia, Pa.

Filed Nov. 21, 1977, Ser. No. 853,193
Int. Cl.³ G08B *17/06*
U.S. Cl. 340—577 **10 Claims**



1. A safety system having a fire detector and alarm combined with an emergency light system and a conventional light, and being designed for installation in a building and connected to the building power lines at an electrical box recessed in a wall or ceiling, said safety system comprising:

(a) a housing;

(b) a fire detector, secured inside the housing, having alarm means responsive to the fire detector sensing fire;

(c) an emergency light system, mounted inside the housing, having a light source of sufficient intensity for illuminating the space around said safety system when power to the building power lines is interrupted;

(d) means for providing continuous electric power to the fire detector and the emergency light systems upon interruption of said power to the building power lines;

(e) first means for securing the housing to an electrical box; and

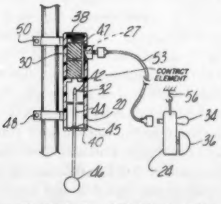
(f) second means for securing a conventional light fixture to the housing.

4,255,747

SUMP PUMP LEVEL WARNING DEVICE

Roderick J. Bunia, 1433 Lila, Troy, Mich. 48098

Filed Nov. 15, 1978, Ser. No. 960,879
Int. Cl.³ G08B *21/00*
U.S. Cl. 340—624 **3 Claims**



1. A sump well fluid level indicator for a sump having a submersible discharge pump at the bottom of the sump well and a fluid discharge line extending upwardly out of the sump well from the pump, comprising:

a housing secured to the discharge line,

a float actuated switch disposed within said first housing, said switch including a conductor element secured to the uppermost portion of a nonconducting elongated shaft extending outwardly from the bottom of said first housing and having a buoyant member secured to the lower end of said shaft externally of said housing,

electric circuit means for conducting electrical power through said switch, including a battery disposed within said first housing directly above said conductor element whereby when said float switch is activated, said conductor element contacts a single terminal of said battery, whereas when said float switch is deactivated, said conductor element is spaced apart from said single battery terminal,

a second housing,

an alarm secured to said second housing,

a signal light secured to said second housing,

first selectively engageable connector means for detachably connecting said second housing to said first housing, and at the same time electrically connecting said electric circuit means to said alarm and said signal light, whereby when said switch is closed said alarm and signal light are activated,

second selectively engagable connector means for detachably connecting said second housing to a support structure remotely positioned with respect to said first housing when said first connector means is disengaged, and

third selectively engagable connector means for electrically connecting said electric circuit means to said alarm and signal light when said first connector means is disengaged,

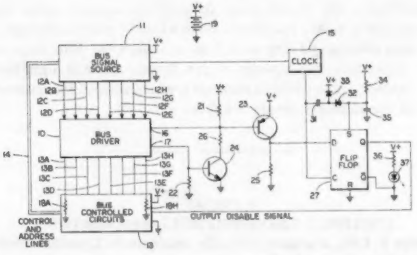
wherein said buoyant member remains disposed externally of said first housing when said switch is in its open and closed positions.

4,255,748

BUS FAULT DETECTOR

Peter G. Bartlett, Davenport, Iowa, assignor to Automation Systems, Inc., Eldridge, Iowa

Filed Feb. 12, 1979, Ser. No. 11,327
Int. Cl.³ G01R *31/00*; G06F *11/00*
U.S. Cl. 340—661 **22 Claims**



1. Digital equipment which includes a circuit useful for detecting faults comprising:

(a) digital signal source means for supplying digital information, said signal source having two voltage supply leads;

(b) voltage supply means for supplying direct current to said digital signal source means, said voltage supply means having two terminals which connect with the two voltage supply leads of said signal source means;

(c) said digital signal source means being characterized by having more current flow through one of its voltage supply leads in a non-transition state when a fault condition occurs than when no fault condition occurs;

(d) digital signal load means for receiving digital information from said digital signal source means, said load means

having its inputs supplied with power by said voltage supply source through said signal source;

(e) a bus connecting said signal source means to said signal load means; and

(f) detector means, responsive to the current flow between said voltage supply means and said signal source means and for indicating a fault if the current flow is greater than a reference level, said detector means having sufficient sensitivity to respond to an increase in current in an amount which would result from a load of 100 ohms placed on an output.

4,255,749

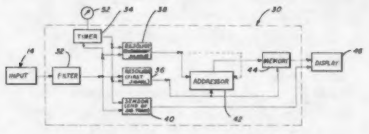
APPARATUS FOR CONVERTING CODE SIGNAL TO VISUAL DISPLAY

Gary G. Henry, 335 Brooksboro Dr., Webster, N.Y. 14580

Filed Dec. 26, 1979, Ser. No. 106,744

Int. Cl.³ G08B *5/36*

U.S. Cl. 340—706 **12 Claims**



1. Apparatus for converting a train of signals representative of a code corresponding to a letter, number, or symbol to a visual display of such corresponding letter, number, or symbol, said train of signals being made up of individual signals of at least two distinct time durations, said apparatus comprising:

means for producing a clock signal of a preselected time duration for each individual signal in said train of signals;

means for resolving the time relation of each of said individual signals in the train of signals to said clock signal, said resolving means including means for producing a first signal if said signal being resolved is less than said clock signal, and a second signal if said signal being resolved is greater than said clock signal;

addressor means for receiving said first and second signals produced by said resolving means and storing said signals to generate a given address dependent upon the particular signals and the order said signals are received, said addressor means producing a signal representative of said given address;

memory means containing a respective letter, number, or symbol corresponding to each address of said addressor means and receiving said signal from said addressor means representative of said given address, said memory means producing a signal representative of such respective letter, number, or symbol of said given address;

sensing means for sensing the end of the train of signals and producing a signal indicative of the end of the train of signals; and

display means associated with said memory means and said sensing means for receiving said signal representative of said respective letter, number, or symbol and said signal from said sensing means and producing a visual display of said respective letter, number, or symbol when said sensing means senses the end of said train of signals.

4,255,750

MULTIPLE CELL ELECTROMAGNETIC RADIATION TEST SYSTEM

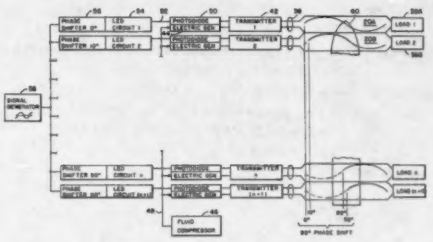
Leon H. Riley, 7707 Logan Dr., SW., Huntsville, Ala. 35802

Filed Jun. 18, 1979, Ser. No. 50,007

Int. Cl.³ G01R *29/08*

U.S. Cl. 343—703 **8 Claims**

1. An electromagnetic radiation test system for varying the degree of electromagnetic radiation generated in a bounded space, comprising: transmission line stripline cell means disposed to provide said bounded space for having said electromagnetic radiation generated therein, means for generating radio frequency voltage coupled to said stripline cell means for developing said electromagnetic radiation therein, load means



coupled to said cell means for dissipating said radio frequency voltages after passage of said voltages through the stripline cell means, and an aperture through said stripline cell means for receiving an object to be subjected to said electromagnetic radiation.

4,255,751

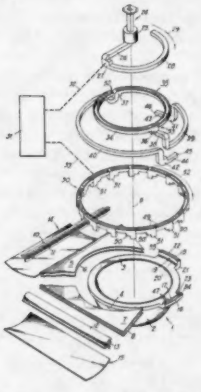
FEED MECHANISM FOR A GEODESIC LENS

Robert M. Goodman, Jr., Marietta, Ga., assignor to Georgia Tech Research Institute, Atlanta, Ga.

Filed Nov. 20, 1979, Ser. No. 95,953

Int. Cl.³ H01Q *19/06, 3/18*

U.S. Cl. 343—754 **18 Claims**



1. In combination with a geodesic Luneberg lens having a longitudinal axis, annular parallel plate conductors centered on said axis and lying in planes perpendicular thereto, said conductors defining output lips of said lens, a first set of inner and outer plates joined respectively to said parallel plate conductors and lying on spaced arcs centered on said axis and disposed outwardly of said parallel plate conductors, said first set defining a first set of input lips, and a second set of inner and outer plates joined respectively to said parallel plate conductors and lying on spaced arcs centered on said axis and disposed outwardly of said parallel plate conductors, said second set defining a second set of input lips circumferentially displaced from said first set of input lips; microwave feed means for scanning said sets of input lips along their arcuate lengths, said feed means comprising a pair of stationary, arcuate waveguide segments positioned above said input lips, a common waveguide feed section, commutating feed means for alter-

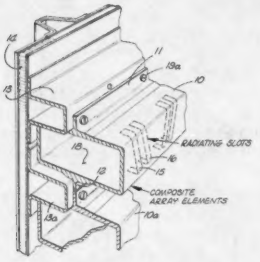
nately coupling said segments to said common waveguide section, a rotatable ring of feed horns disposed between said waveguide segments and said input lips, said ring being centered on said longitudinal axis.

4,255,752

LIGHTWEIGHT COMPOSITE SLOTTED-WAVEGUIDE ANTENNA AND METHOD OF MANUFACTURE

Walter J. Noble, Valencia, and John W. Small, Redondo Beach, both of Calif., assignors to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Sep. 13, 1978, Ser. No. 942,070
Int. Cl.³ H01Q *13/10*
U.S. Cl. 343—771 **10 Claims**



1. A light-weight, high strength, composite slotted-waveguide antenna comprising:

a thin, conductive, electro-deposited, inner wall having a predetermined pattern of slots therein forming the radiating elements of said antenna;

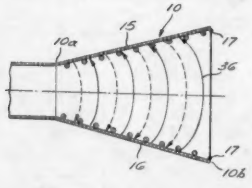
an outer shell over and adherent to the outer surface of said inner wall, said shell comprising a laminate of a plurality of layers of mutually adherent, low-loss fiber held in a cured, low-loss, thermosetting, plastic binder, said shell substantially completely covering said outer surface of said inner wall to provide an integral structure having mechanical strength and affording a sealed structure with radio frequency transmissability through said shell at said slots, and fibers of each of said layers being placed so said fibers of a given layer make a predetermined angle with respect to the fibers of each layer adjacent to said given layer.

4,255,753

ANTENNA CONSTRUCTION FOR REDUCING SIDE LOBES OF THE RADIATION PATTERN

Edward Lovick, Jr., Northridge, Calif., assignor to Lockheed Corporation, Burbank, Calif.

Filed Jun. 27, 1979, Ser. No. 52,607
Int. Cl.³ H01Q *13/00*
U.S. Cl. 343—786 **5 Claims**



1. An antenna construction for reducing the side lobes of a radiation pattern comprising:

a wave guide;

an antenna horn connected with said wave guide and having a horn wall arranged at an angle to the axis of said wave guide; said antenna radiating an energy in an E plane;

a helical coil of wire secured to the interior surface of said horn wall and having substantially the same shape as said wall;

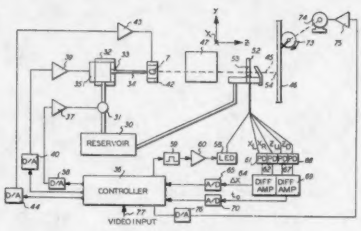
the diameter of said wire and the number of coil turns along said horn wall being such as to delay the portion of the E plane at the aperture of said antenna horn sufficiently to make said delayed portion out of phase with the E plane portion propagated away from said horn wall.

4,255,754

DIFFERENTIAL FIBER OPTIC SENSING METHOD AND APPARATUS FOR INK JET RECORDERS

Peter A. Crean, Penfield, and Paul R. Spencer, Webster, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Mar. 19, 1979, Ser. No. 21,420
Int. Cl.³ G01D *18/00*
U.S. Cl. 346—75 **27 Claims**



1. A fluid drop recorder comprising

a record member support and a fluid drop generating means positioned for relative movement in the x, y plane of an x, y and z orthogonal coordinate system, and

fluid drop sensor means for sensing the location of drops emitted along the z axis by the fluid drop generating means including at least one axis sensor including an input optical means and two output optical fibers having free ends facing each other for sensing a drop along either the x or y axis with light emitted by the input fiber and entering the output fibers.

4,255,755

HETEROSTRUCTURE SEMICONDUCTOR DEVICE HAVING A TOP LAYER ETCHED TO FORM A GROOVE TO ENABLE ELECTRICAL CONTACT WITH THE LOWER LAYER

Kunio Itoh, and Morio Inoue, both of Takatsuki, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Continuation of Ser. No. 772,927, Feb. 28, 1977, abandoned, which is a continuation of Ser. No. 555,082, Mar. 4, 1975, abandoned. This application Dec. 13, 1978, Ser. No. 968,924
Claims priority, application Japan, Mar. 5, 1974, 49-25943; Mar. 5, 1974, 49-25944; Mar. 5, 1974, 49-25945; Mar. 5, 1974, 49-25946
Int. Cl.³ H01S *33/19*; H01L *29/305, 29/80, 29/06*
U.S. Cl. 357—18 **6 Claims**

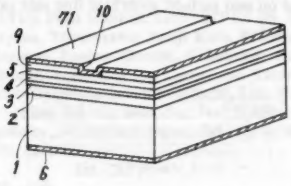
1. A heterostructure multi-layer semiconductor device comprising:

an epitaxially grown uppermost semiconductor crystal layer of a given material having one conductivity type;

an underlying semiconductor crystal layer of different material lying immediately under said uppermost crystal layer and having a conductivity type opposite to that of said uppermost layer;

said uppermost semiconductor crystal layer and said underlying semiconductor crystal layer being epitaxially grown and forming a p-n heterojunction therebetween for electrical isolation;

said uppermost semiconductor crystal layer having at least one chemically etched stripe-shaped groove which exposes a part of the upper face of said underlying semiconductor crystal layer; and



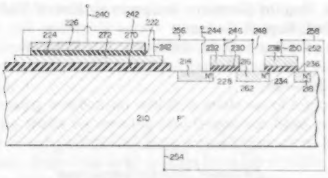
a metal electrode formed onto the surface of said underlying semiconductor layer exposed by said at least one chemically etched groove in said uppermost semiconductor crystal layer, said metal electrode contacting and extending over the surface of said uppermost semiconductor crystal layer.

4,255,756

SUBSTRATE BIAS GENERATOR

Kazuhiro Shimotori; Takao Nakano, and Yasuzi Nagayama, all of Itami, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 3, 1980, Ser. No. 109,399
Claims priority, application Japan, Jan. 5, 1979, 54-883
Int. Cl.³ H01L 27/02
U.S. Cl. 357—51 **5 Claims**



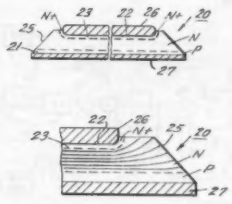
1. A substrate bias generator for generating a potential in a semiconductor substrate, comprising a semiconductor substrate of a first type conductivity including a pair of first and second main faces opposite to each other, a first, a second and a third semiconductor regions of a second type conductivity disposed at predetermined intervals on said first main face of said semiconductor substrate, a first MOSFET disposed on said first main face of said semiconductor substrate and including a source region formed of said first semiconductor region, a drain region formed of said second semiconductor region and a gate electrode, a second MOSFET disposed on said first main face of said semiconductor substrate and including a source region formed of said second semiconductor region, a drain region formed of said third semiconductor region, and a gate electrode, a capacitor disposed on said first main face of said semiconductor substrate through an electrically insulating film, said capacitor including a pair of opposite electrodes and another electrically insulating film interposed between said electrodes, a first electric lead for connecting one of said electrodes of said capacitor to said gate electrode and drain region of said first MOSFET, and a second electric lead for connecting said gate electrode and drain region of said second MOSFET to an electrode connected to said second main face of said semiconductor substrate, said capacitor having a signal applied to the other electrode thereof, said first MOSFET having a source electrode connected to a ground potential.

4,255,757

HIGH REVERSE VOLTAGE SEMICONDUCTOR DEVICE WITH FAST RECOVERY TIME WITH CENTRAL DEPRESSION

Boris L. Hikin, Playa del Rey, Calif., assignor to International Rectifier Corporation, Los Angeles, Calif.

Filed Dec. 5, 1978, Ser. No. 966,644
Int. Cl.³ H01L 29/12, 29/90, 29/34
U.S. Cl. 357—58 **14 Claims**



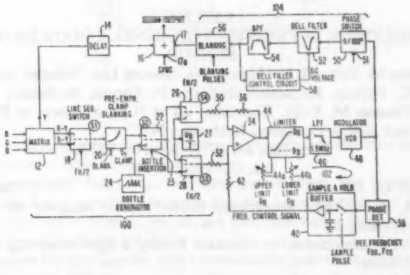
1. A high voltage semiconductor device which at least includes a P-I-N diode comprising a monocrystalline wafer of semiconductor material having first and second spaced, generally parallel surfaces; said wafer having a first region of one of the conductivity types extending from said first surface; a second and central region ajoining one side of said first region and being of the other of the conductivity types and having a relatively high resistivity; and a third region of said other of the conductivity types which adjoins the opposite side of said central region and extends to said second surface; said third region having a central depression therein; said third region generally following the contour of said central depression and terminating on said second surface; said first, second and third regions having a common peripheral edge, whereby electric field equipotential lines during reverse biasing of said P-I-N diode are relatively widely distributed around said edge of said wafer to decrease the local field stress on said edge of said device.

4,255,758

SELF-ADJUSTING BELL FILTER CIRCUIT FOR USE IN SECAM CODERS

Felix Aschwanden, Thalwil, Switzerland, assignor to RCA Corporation, New York, N.Y.

Filed Nov. 13, 1979, Ser. No. 93,221
Int. Cl.³ H04N 9/40
U.S. Cl. 358—14 **11 Claims**



1. A method for adjusting the frequency response of a bell filter used in a SECAM encoder, said method comprising

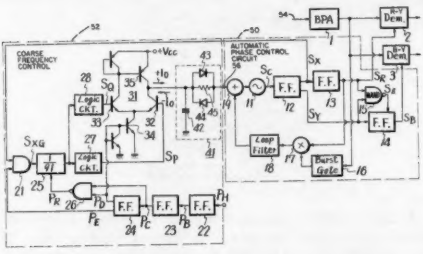
sampling the amplitude of an output signal from said bell filter, and adjusting the frequency response by providing a control voltage to said filter in accordance with the sampled amplitude.

4,255,759

COLOR TELEVISION RECEIVER AFPC CIRCUIT

Shoji Ohmori, Tachikawa; Atsushi Matsuzaki, Yokohama, and Kiyonori Tominaga, Tokyo, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Nov. 6, 1978, Ser. No. 957,740
Claims priority, application Japan, Nov. 11, 1977, 52/135943
Int. Cl.³ H04N *9/46*
U.S. Cl. 358—19 **26 Claims**



1. A reference carrier generator for a color television receiver having a color demodulator and which receives a color television signal containing a color burst signal, said reference carrier generator comprising:

a voltage controlled oscillator operative to supply a reference carrier to said color demodulator,

phase comparator means for comparing phases of an output of said voltage controlled oscillator and the color burst signal in the received color television signal, said phase comparator means supplying a first control signal to said voltage controlled oscillator, said first control signal being effective to change the frequency of said voltage controlled oscillator,

gating means for gating an output of said voltage controlled oscillator with a reference signal which has a known frequency substantially different from said output,

reset signal generator means for generating a reset signal during part of one cycle of said reference signal,

counter means for counting an output of said gating means and being reset by said reset signal, and

decoding means responsive to an output of said counter means for generating a second control signal supplied to said voltage controlled oscillator, said second control signal being effective to change the frequency of said voltage controlled oscillator.

4,255,760

MULTIPLE, SUPERPOSED-CHANNEL COLOR IMAGE SENSOR

Peter M. Zeitzoff, Rochester; Teh-Hsuang Lee, Webster; Bruce C. Burkey, Rochester; Rajinder P. Khosla, Rochester, and Thomas M. Kelly, Rochester, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

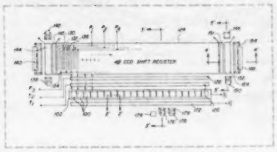
Filed Sep. 28, 1979, Ser. No. 79,736
Int. Cl.³ H04N *9/04*
U.S. Cl. 358—41 **7 Claims**

1. A multiple, superposed-channel color imaging device, comprising:

(a) a semiconductor substrate having a light receiving surface;

(b) a plurality of superposed, ladder-shaped, light responsive channels disposed within said substrate said channels being responsive to respective different wavelength ranges of light to form respective photosignals due to the phenomenon of differential absorption of light by a semiconductor, said ladder shape comprising first and second side rails connected by a plurality of rungs, said first side rail providing channel structure for a multiple, superposed-channel charge transfer device, said rungs providing channel structure for a plurality of multiple, superposed-channel image sensing sites, and said second side rail providing channel structure for multiple, superposed anti-bloom drains;

(c) a plurality of interdigited charge transfer electrodes disposed on said surface, over said first side rail;



(d) a transparent sensing gate disposed on said surface over said rungs;

(e) transfer gate means disposed on said surface between said transparent sensing gate and said charge transfer electrodes for transferring photosignals from said sensing sites to said charge transfer device;

(f) an anti-bloom control gate disposed on said surface over said second side rail for controlling the overflow potential into said anti-bloom drains; and

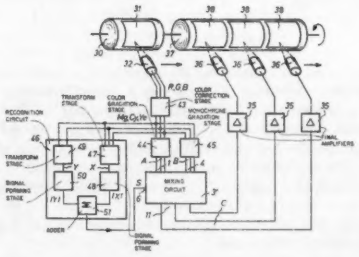
(g) output means for transferring said photosignals from said charge transfer device.

4,255,761

APPARATUS FOR MIXING IMAGE SIGNALS TO OBTAIN A PRINTING MASTER

Hans-Georg Knop, Heikendorf, and Ingo Hoffrichter, Keil, both of Fed. Rep. of Germany, assignors to Rudolf Hell GmbH., Kiel, Fed. Rep. of Germany

Filed Feb. 21, 1978, Ser. No. 879,596
Int. Cl.³ G03F *3/08*
U.S. Cl. 358—80 **5 Claims**



1. In a process of changing the gradation of an image including a plurality of colors for effecting a predetermined change in the image,

the steps comprising:

photoelectrically scanning said image to obtain an image signal, said image signal including a predetermined ratio of chrominance components to luminance components,

generating a control signal in dependence of said predetermined ratio,

allotting to said control signal a first level when said chrominance components are present in a predetermined amount in said image signal, a second level when said luminance

components are present in a prearranged amount in said image signal, whereby, when said ratio of chrominance-to-luminance components in said image signal is gradually changing, a gradually changing level between said first and second levels is obtained, and

modulating the image signal with the control signal, and generating a printing master from the modulated image signal.

4,255,762

APPARATUS FOR INSPECTING PIPES IN A PLANT

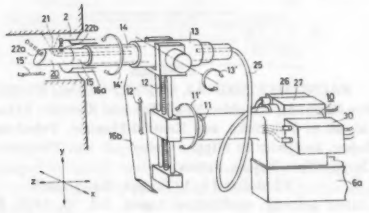
Kiyoo Takeyasu, Tokorozawa; Kanji Kato, Kokubunji; Tatsuo Goto, Hamura; Yoozoo Oouchi, Kokubunji; Kazuhiro Yoshida, Hitachi; Yoshitoshi Ito, Oume, and Katsumi Takami, Tokyo, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jul. 12, 1979, Ser. No. 56,853

Claims priority, application Japan, Jul. 26, 1978, 53-90466; Jul. 26, 1978, 53-90467

Int. Cl.³ H04N *7/18*

U.S. Cl. 358—100 **8 Claims**



1. Apparatus for inspecting pipes in a plant, comprising:

an inspection head portion which is provided with an optical system for receiving an image of an inner surface of the pipe being an object to-be-inspected,

means for converting the inspection image received into said optical system, into electrical video signals,

at least one proximity sensor which is disposed in said inspection head portion in order to detect a relative distance between said inspection head portion and the proximate object,

a positioning mechanism which is made up of a plurality of driving shafts for moving said inspection head portion,

control means capable of programmed operation, for guiding said inspection head portion from an initially set position outside the pipe to an inspection position inside said pipe and moving said inspection head portion along a track set with reference to the object to-be-inspected and without contact with said object to-be-inspected, and for driving said positioning mechanism in a predetermined operation sequence programmed in advance in response to an output signal from said proximity sensor, and

image processing means situated at a position remote from said inspection head portion and for reconstructing the inspection image from the video signal.

4,255,763

TECHNIQUE FOR REDUCING TRANSMISSION ERROR PROPAGATION IN AN ADAPTIVELY PREDICTED DPCM VIDEO ENCODER

Nicholas F. Maxemchuk, Mountainside, N.J., and John A. Stuller, Rolla, Mo., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Dec. 26, 1979, Ser. No. 107,262

Int. Cl.³ H04N *7/12*

U.S. Cl. 358—135 **8 Claims**

1. Apparatus for encoding a video signal representing the intensity of picture elements (pels) of a picture including:

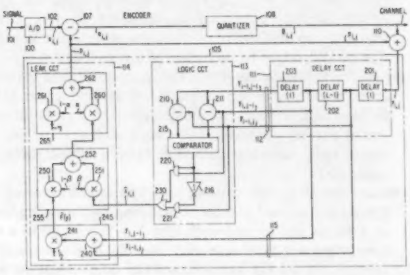
means (**105**) for predicting the intensity of each pel as a function of reconstructed intensity values of previously encoded pels;

means (**107**) for forming an error signal indicative of the difference between the intensity of each pel and the predicted intensity thereof;

means (**108**) for quantizing said error signal; and

means (**110**) for combining the quantized error signal with said predicted intensity to form said reconstructed intensity value,

wherein said predicting means (**105**) includes:



first means (**113**) for forming an intermediate prediction of the intensity of said each pel as a function of the reconstructed intensity value of at least a selected one of the pels in the neighborhood thereof; and

second means (**114**) for forming said predicted intensity as a function of said intermediate prediction,

characterized in that said second forming means (**114**) forms said predicted intensity also as a function of the reconstructed intensity values of at least first and second ones of said neighboring pels.

4,255,764

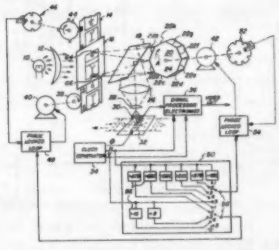
FILM SCANNER EMPLOYING OPTICAL SPLICE TECHNIQUE FOR FRAME-RATE CONVERSION

Dennis G. Howe, Pittsford, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Aug. 20, 1979, Ser. No. 68,032

Int. Cl.³ H04N *3/36*

U.S. Cl. 358—214 **5 Claims**



1. A film scanner for producing television signals from motion picture film, comprising:

a stationary film gate, said film gate defining an opening having a top and bottom edge, the opening between the top and bottom edges of said film gate being larger than one film frame height;

means for moving the film continuously past the opening at a controlled rate;

means for projecting an image of the film in said gate;

a solid-state line sensing array for scanning the image of the film, line by line, in a direction generally perpendicular to

the length of the film at a standard television line rate to produce a television signal;

multifacet mirror means having a plurality of reflecting facets disposed about a central axis, said mirror means being journalled for rotation about said axis and being disposed with respect to said projection means for reflecting the image of the film onto said array such that reflections from adjacent facets will be displaced by substantially one film frame height, whereby the reflected images of said film gate from adjacent facets overlap;

means for rotating said mirror means about said axis at a controlled rate to thereby cause an image reflected by one of said facets to sweep across said array, in effect causing said array to repeatedly vertically scan said film gate from one of said edges to the other at a controlled rate;

means for fading-in the projected image reflected by a facet at the beginning of the sweep across the line sensor and for fading-out the projected image reflected by a facet at the end of a sweep across the line sensor such that the percentage of light reaching the sensor remain substantially constant; and

control means for controlling said film moving means at X frames per second and for controlling said rotating means at Y facets per second such that $X+Y$ is equal to a standard television field rate, and wherein X is a non-integral submultiple of the television field rate, whereby exact frame-rate conversion is achieved by forming a television field from portions of two adjacent film frames whenever the vertical scan reaches an edge of the film gate before the scan of a film frame has been completed.

4,255,765

THEODOLITE FOR TRACKING AND MEASURING A FLYING OBJECT WITH A TV CAMERA ARRANGED AT A TELESCOPE

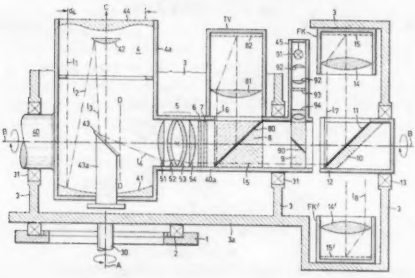
C. Friso van Mansvelt, Wallisellen; Hansruedi Ritter, Rümlang, and Walter Eicher, Gockhausen, all of Switzerland, assignors to Contraves AG, Zurich, Switzerland

Filed Sep. 7, 1979, Ser. No. 73,535

Claims priority, application Switzerland, Sep. 20, 1978, 9809/78

Int. Cl.³ G02B *23/12*; H04N *5/26*

U.S. Cl. 358—225 **2 Claims**



1. A theodolite for tracking and measuring a flying target comprising:

telescope means having a telescope tube;

said telescope means containing a mirror objective and a collimator;

a theodolite housing;

means for mounting said telescope means rotatably relative to the theodolite housing about a substantially horizontal axis;

means for mounting said theodolite housing for rotation about a substantially vertical axis;

said collimator projecting a real image produced by the mirror objective to infinity, to thereby deliver an afocal bundle of light rays;

a television camera;

at least one image evaluation device;

means defining a first partially permeable mirror surface;

said bundle of light rays being delivered by means of said first partially permeable mirror surface to said television camera and said at least one image evaluation device;

means for producing an image of a crosshair;

means defining a second mirror surface for fading-in the image of the crosshair at the light beam bundle;

at least one of said image evaluation devices having a faded-in image appearing therein;

said television camera having a faded-in free image appearing therein; and

said mirror objective, said collimator, said first and second mirror surfaces and at least one further mirror surface are linearly arranged in an afocal bundle of light beams extending essentially linearly.

4,255,766

FACSIMILE SIGNAL SUPERPOSING SYSTEM

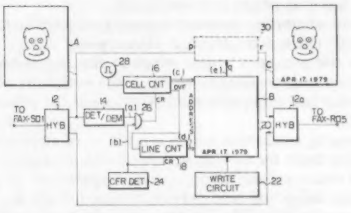
Hideo Matsuda; Kiyohiro Yuki; Takashi Kawade; Takaaki Adachi, all of Yokosuka, and Kenichi Hanabe, Yokohama, all of Japan, assignors to Nippon Telegrpah and Telephone Public Corporation, Toyko, Japan

Filed Jul. 10, 1979, Ser. No. 56,287

Claims priority, application Japan, Jul. 10, 1978, 53-82926; Jul. 10, 1978, 53-82927; Aug. 14, 1978, 53-98814; Aug. 14, 1978, 53-98815

Int. Cl.³ H04N *1/32, 3/22*

U.S. Cl. 358—257 **5 Claims**

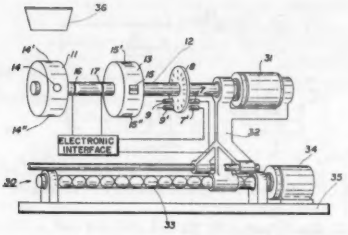


1. A facsimile superposing system for superposing an additional pattern on an original pattern comprising an input means for receiving the analog type original facsimile pattern signal modulated by either the AM, AM-PM, FM, or PM systems, a digital memory having the capacity enough to store the additional pattern to be superposed, an insertion circuit having a first input terminal connected to said input means, a second input terminal connected to the output of said digital memory and an output terminal for providing the sum of the first and the second input terminal signals, a write circuit connected to said digital memory for writing a desired pattern into the memory, an address circuit including a cell counter and a line counter both connected to said memory for addressing said digital memory, said cell counter having the capacity equal to the number of cells in a single scanning line of the original pattern and the line counter having the capacity enough to count the number of scanning lines of the additional pattern, a cell clock generator to increment said cell counter and the frequency of which is equal to the scanning frequency of the original pattern, said line counter being incremented by the overflow pulse of said cell counter, and output means connected to the output terminal of said insertion circuit.

4,255,767
ELECTRONICALLY CONTROLLED MAGNETIC RECORDING

Thomas M. Frey, Brighton, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Continuation of Ser. No. 783,909, Apr. 1, 1977, abandoned. This application Jan. 15, 1979, Ser. No. 3,332
Int. Cl.³ H04N 1/28
U.S. Cl. 358—301 6 Claims



1. A magnetic image recorder for optically scanning an original document and for producing a latent magnetic image thereof comprising

platen means for supporting a document to be recorded,

a second rotational member having n number of magnetic recording heads thereon at a distance R from its axis of rotation corresponding to the n number of scanning means,

a first rotational member having n number of scanning means thereon, the member being spaced from its axis of rotation to the platen means by a distance of about n times R to enable each scanning means to scan segments of a document on the platen means to generate a series of data signals representative of the optical density levels of segments on a document where n is an integer equal to or greater than two,

first translation means for effecting relative movement between the platen means and the first rotational member in a direction generally normal to the scanned segment of a document to enable each of the n scanning means to scan adjacent, generally parallel, segments of a document,

magnetic tape supporting means for supporting a magnetic tape adjacent the second rotational member to enable each recording head to record a series of magnetic transitions along a segment of a magnetic tape,

second translation means for effecting relative movement between the magnetic tape supporting means and the second rotational member to enable each of the n recording heads to record on adjacent, generally parallel, segments of a magnetic tape and

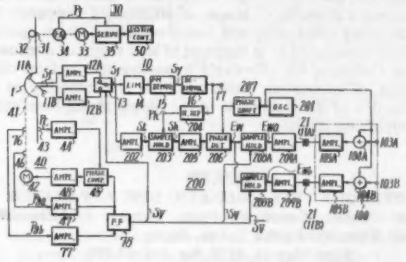
synchronous means for effecting synchronous rotation of the first and second rotational members and synchronous movement of the first and second translation means,

buffer means including n number of storage means each coupled to a corresponding scanning means and recording head, load means for loading data signals into a sotrage means during the generation thereof at a rate of about 1/n times one revolution time period of the first rotational means and unload means for unloading data signals from a storage means to a recording head at a rate of about (n−1)/n times one revolution time period of the first rotational means.

4,255,768
TRACKING CONTROL APPARATUS FOR A ROTARY HEAD, VARIABLE SPEED SIGNAL REPRODUCING SYSTEM

Yukio Kubota, Takaidonishi, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Sep. 13, 1979, Ser. No. 75,516
Claims priority, application Japan, Sep. 14, 1978, 53-113445
Int. Cl.³ G11B 21/10, 21/08; H04N 5/78
U.S. Cl. 360—10 32 Claims

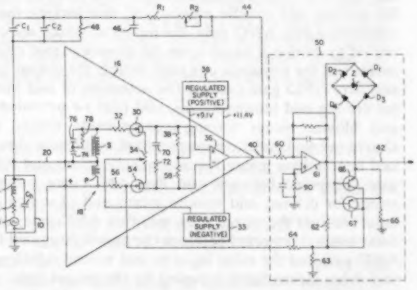


1. In a signal reproducing system of the type having rotary transducer means for scanning traces across a movable record medium to reproduce signals from previously recorded record tracks, and displaceable support means for supporting said transducer means and responsive to control signals to displace said transducer means relative to said record tracks, and wherein said record medium is movable at a speed which may result in a tracking error deviation of the scanning traces of said transducer means from said record tracks, apparatus for generating said control signals, comprising frequency generating means for generating speed representing pulses whose frequency is a function of the speed at which said record medium is moved; cyclical counting means for cyclically counting said speed representing pulses; and level generating means for generating a signal level corresponding to the count then present in said counting means at the time that said transducer means advances to the middle portion of a scanning trace.

4,255,769
LOW-NOISE PREAMPLIFIER

Thomas K. Naylor, Belmont, and George A. Cavigelli, Lexington, both of Mass., assignors to American Optical Corporation, Southbridge, Mass.

Filed Jun. 28, 1979, Ser. No. 53,017
Int. Cl.³ G11B 5/45, 5/02
U.S. Cl. 360—65 15 Claims



1. A preamplifier for small signals generated in an inductive playback head by relative motion between the playback head and a magnetic recording medium having the signals recorded thereon, comprising amplifying means having an input and an

output, means for extending the small signal from the playback head to said amplifying means input, feedback means connected from said output to said input of said amplifying means for providing negative feedback of a portion of the signal applied to said input, said feedback means being operative to provide at said amplifying means output the integral of the signal within said playback head; and

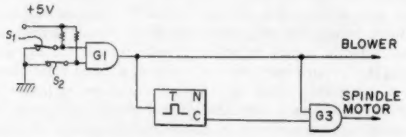
base line restoration means operatively connected in negative feedback relationship with said amplifying means, said base line restoration means including a non-linear resistive attenuator, said non-linear resistive attenuator having a plurality of stages of attenuating resistance in cascading relationship and biased switching means operatively connected to at least one of said stages of attenuating resistance for effectively bypassing said at least one stage of attenuating resistance from said plurality as a function of the magnitude of the output signal from said amplifying means.

4,255,770

DUSTPROOF TYPE MAGNETIC DISC APPARATUS

Yasushi Onooka, Kamakura, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed May 21, 1979, Ser. No. 41,195
Claims priority, application Japan, May 23, 1978, 53/69592
Int. Cl.[3] G11B *17/02*
U.S. Cl. 360—69 **3 Claims**



1. A dustproof type magnetic disc apparatus which comprises:

a magnetic disc pack containing magnetic recording discs; a shroud for providing a housing for said magnetic disc pack;

a ceiling means for closing said shroud after said magnetic disc pack is placed within said shroud;

means for providing inlet air to said shroud;

an outlet means provided in said shroud for said inlet air;

a blower means for providing said inlet air to said shroud; a spindle means provided through an opening in said shroud and connected to said magnetic disc pack for rotating said magnetic disc pack;

a motor for driving said blower means;

a motor for driving said spindle means; and

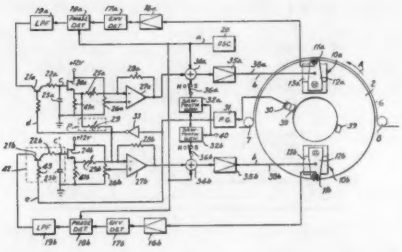
an interlocking means connected in mutual relationship to said motor for driving said blower means and said motor for driving said spindle means, said interlocking means including a first AND gate, the inputs of which are connected to receive a signal upon the closing of said ceiling means and the actuation of a start switch, the output from said first AND gate causing the actuation of said motor for driving said blower means, said inlet air provided by said blower means forcing contaminants within said shroud out said outlet means provided within said shroud; said interlocking means further including a second AND gate connected between said first AND gate and said motor for driving said spindle means and of which one input receives the output from said first AND gate; and a delay means connected between the output from said first AND gate and the other input to said second AND gate, said delay means being actuated by the output from said first AND gate and providing an output signal to the other input of said second AND gate a predetermined period of time after the actuation of said motor for driving said blower means; said second AND gate, upon receipt of the signal from said delay means, actuating said motor for driving said spindle means, whereby contaminants are removed from said shroud and said magnetic disc pack prior to magnetic recording on said magnetic recording disc.

4,255,771

VIDEO SIGNAL REPRODUCING APPARATUS

Yukio Kubota, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed May 14, 1979, Ser. No. 38,821
Claims priority, application Japan, May 15, 1978, 53-57307
Int. Cl.[3] G11B *21/10, 21/18, 5/58*
U.S. Cl. 360—77 **7 Claims**



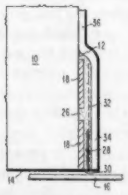
1. An automatic tracking device operative to produce a first and a second control signal for an apparatus having first and second magnetic heads adapted to alternately scan mean paths along parallel recorded tracks on a magnetic recording medium, comprising: first and second positioning means associated respectively with said first and second magnetic heads for displacing said mean paths of said first and second magnetic heads into substantial coincidence with a single one of said parallel recorded tracks in response to said first and second control signals, respectively; first and second control signal generating means for alternately generating said first and second control signals; means in said first control signal generating means for holding a level of said control signal existing at the end of scanning by said first magnetic head; and transfer means for transferring at least part of said level to said second control signal generating means which is thereupon operative to bias said second positioning means for displacing in a direction tending to coincide said mean path of said second magnetic head with the same track scanned by said first magnetic head.

4,255,772

READ/WRITE MAGNETIC HEAD ASSEMBLY WITH MAGNETORESISTIVE SENSOR

Henry S. Perez, San Jose, and Theodore A. Schwarz, Saratoga, both of Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 29, 1979, Ser. No. 53,165
Int. Cl.[3] G11B *5/12, 5/30*
U.S. Cl. 360—113 **12 Claims**



1. A thin film magnetic head assembly for recording and reading data comprising:

a magnetic substrate for serving as a first pole piece, said substrate having an air bearing surface;

a magnetically soft conductor means for providing magnetic shielding disposed on a second surface of said substrate , a portion of said conductor means being at said air bearing surface, said second surface being substantially orthogonal to said air bearing surface:

a second pole piece located in juxtaposition to said substrate to form a magnetic circuit with said first pole piece;

a magnetoresistive element disposed between said conductor means and said second pole piece;

a first insulating layer disposed between said conductor means and said magnetoresistive element;

a second insulating layer disposed between said magnetoresistive element and said second pole piece,

so that a write transducing gap is formed between said substrate and said second pole piece, and a read transducing gap is effectively formed between said conductor means and said second pole piece.

4,255,773
GROUND FAULT INTERRUPTOR

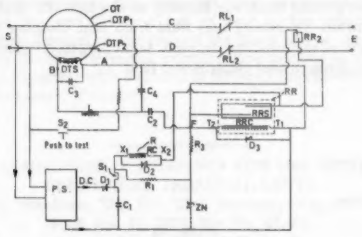
Harbhajan S. Jabbal, 2F/14 Double Storey Circular Rd. N.I.F., Haryana, India

Continuation of Ser. No. 816,749, Jul. 18, 1977, abandoned. This application Feb. 12, 1979, Ser. No. 11,695

Claims priority, application United Kingdom, Mar. 24, 1977, 12452/77

Int. Cl.³ H02H *3/33*

U.S. Cl. 361—45 **6 Claims**



1. A ground fault interruptor having a circuit comprising a differential transformer having primary windings for connection to a power source, said transformer having a secondary winding, said primary windings connected to a load through the normally closed contacts of a relay or circuit breaker, a reed relay comprising reed relay contacts and a reed relay coil connected to said secondary winding of said transformer, said circuit breaker or relay capable of being connected to a power supply circuit upon the energization of the coil of said reed relay whereby the contacts are open and the load is no longer connected to the primary windings of said differential transformer, a signal processing circuit comprising a capacitor and a diode, connected to the secondary of said differential transformer and said reed relay, wherein said diode is connected across the coil of said reed relay, one terminal of said diode being connected to said capacitor, a d.c. biasing circuit providing a biasing current and connected to said signal processing circuit and said reed relay, said signal processing circuit also connected between said biasing circuit and said secondary winding of said differential transformer, such as to prevent the biasing current from flowing into said secondary winding, said signal processing circuit processing the signal from said secondary and also that of the biasing circuit for increasing the sensitivity of said circuit and also to allow a flow of signal current in the coil of said reed relay in the same direction as that produced by the circuit to maintain said reed relay contacts in a closed condition.

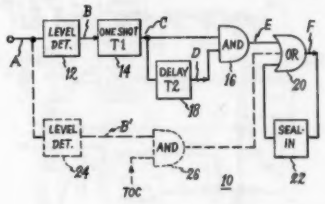
4,255,774
STATIC INSTANTANEOUS OVERCURRENT RELAY WITH LOW TRANSIENT OVERREACH

Thomas B. Breen, Lansdowne, Pa., assignor to General Electric Company, Philadelphia, Pa.

Filed Mar. 16, 1979, Ser. No. 21,143

Int. Cl.³ H02H *3/093*

U.S. Cl. 361—95 **26 Claims**



1. A static instantaneous overcurrent relay with reduced transient overreach for use in protecting an a-c power line from overcurrents wherein the relay receives an input signal representative of the magnitude of the current in the a-c power line and develops a relay output signal when the magnitude of the current in the a-c power line exceeds a predetermined limit, which comprises:

(a) level detector circuit means for receiving the input signal representative of the magnitude of current in the a-c power line, said input signal being in the form of a pulsating waveform having substantially twice the frequency as the frequency of the a-c power line, said pulsating waveform comprising a plurality of discrete pulses, said level detector circuit means developing a discrete level detector output signal in response to each one of said discrete pulses of said pulsating waveform which attains a magnitude representative of a predetermined magnitude of the current in the a-c power line, and

(b) output circuit means coupled to receive said discrete level detector output signals, said output circuit including a temporary inhibit means having means for establishing a first predetermined time duration T2 and a second predetermined time duration T3, said first predetermined time duration T2 commencing upon the occurrence of a first discrete level output signal, said second predetermined time duration T3 commencing upon the termination of said first predetermined time duration T2, said temporary inhibit means temporarily inhibiting the development of said relay output signal until said output circuit means has received said first discrete level output signal and a second discrete level output signal occurring during the second predetermined time period T3, whereby the occurrence of said first and said second discrete level output signals manifest that the magnitude of the current in the a-c power line has exceeded said predetermined limit.

4,255,775
ELECTROSTATIC PRECIPITATOR RAPPER CONTROL SYSTEM WITH ENHANCED ACCURACY

William W. Andrews, Cranford, N.J., assignor to Research Cottrell, Inc., Somerville, N.J.

Filed May 29, 1979, Ser. No. 43,030

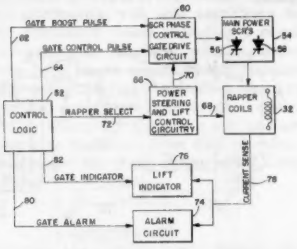
Int. Cl.³ B03C *3/00*; H01H *47/32*

U.S. Cl. 361—153 **28 Claims**

1. In a system for controlling an electrostatic precipitator rapper of the type having a movable plunger biased towards an impact and resting position and having electromagnetic means for displacing the plunger away from the impact and resting position and then releasing the plunger, rapping intensity depending upon plunger displacement before release, said system including means for supplying to the electromagnetic means an

electrical energy pulse of controlled energy for displacing the rapper plunger to a desired position, the improvement which comprises:

means for supplying to the electromagnetic means immediately prior to the pulse of controlled energy an electrical energy boost pulse having a predetermined relatively high



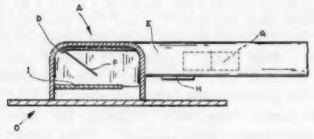
power level and predetermined duration sufficient to overcome plunger initial sticking forces and to just slightly displace the rapper plunger from its impact and resting position, thereby enhancing the accuracy of displacement control effected by the pulse of controlled energy.

4,255,776

APPARATUS FOR NEUTRALIZING ELECTROSTATIC CHARGES AND FOR REMOVING DUST FROM VARIOUS OBJECTS

Paolo Cantelli, Bologna, Italy, assignor to Fiat Srl, Bologna, Italy

Filed Mar. 20, 1979, Ser. No. 22,346
Claims priority, application Italy, Mar. 22, 1978, 67623 A/78
Int. Cl.[3] H05F *3/06*
U.S. Cl. 361—213 **14 Claims**



1. An apparatus for neutralizing electrostatic charges and for removing dust from various objects, the apparatus comprising:

a hollow handle inside which a piezoelectric transducer is housed;

a pushbutton which protrudes from said handle and is coupled to said piezoelectric transducer to set said piezoelectric transducer in operation;

a head having an opening carried by said handle and which is to contact objects to be cleaned; and

at least one metal electrode connected electrically to said piezoelectric transducer, carried centrally inside said head and turned towards said opening therein; and

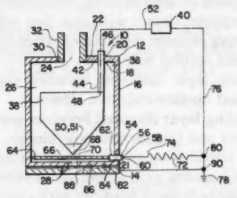
wherein said opening in said head (**D, 3, 27**) is sealed at least in part by a plate (**I, 11, 44**) made of high dielectric constant material, said plate being disposed near and spaced from said electrode covering same and at least partially closing said opening in said head, whereby the head can be placed against an object to be cleaned without discharge from the electrode to the object.

4,255,777

ELECTROSTATIC ATOMIZING DEVICE

Arnold J. Kelly, Princeton Junction, N.J., assignor to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Nov. 21, 1977, Ser. No. 853,499
Int. Cl.[3] B05B *5/00*
U.S. Cl. 361—228 **17 Claims**



1. An electrostatic charging device for electrostatically atomizing fluids into a plurality of charged droplets which includes:

(a) a housing having a chamber therein, said fluid being disposed within said chamber;

(b) means for generating an electrical charge and passing an electrical charge through said fluid in said chamber thereby generating a free excess charge in said fluid within said chamber; wherein said generating means for said electrical charge includes at least a first and a second electrode, said first and said second electrodes being in liquid contact with said fluid within said chamber.

(c) a ground electrode disposed externally to said housing, said ground electrode forming an electrostatic field; and

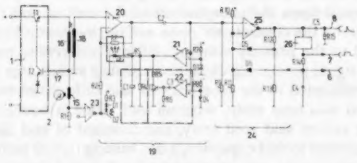
(d) means for issuing said fluid from said chamber in the form of said charged droplets, said charged droplets passing through said electrostatic field.

4,255,778

REFERENCE SIGNAL PROCESSOR CIRCUIT

Werner Breckel, Wendlingen, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Jun. 13, 1979, Ser. No. 48,038
Claims priority, application Fed. Rep. of Germany, Jun. 24, 1978, 2827799
Int. Cl.[3] F02P *17/00*
U.S. Cl. 361—236 **9 Claims**



1. A signal processor comprising:

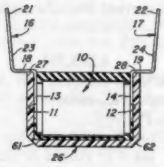
a variable gain control amplifier (**19**) for receiving and processing a periodic signal of varying amplitude and for generating therefrom an output signal of constant amplitude; and

a threshold switch (**24**) connected to said control amplifier to receive said output signal and including circuit means for varying the switching threshold of said threshold switch (**24**) in dependence of the frequency of said periodic signal.

4,255,779
PACKAGE MACHINE INSERTABLE ROLLED METALLIZED FILM CAPACITOR

John R. Meal, Naperville, Ill., assignor to Western Electric Company, Inc., New York, N.Y.

Filed Dec. 28, 1978, Ser. No. 974,209
Int. Cl.³ H01G 1/14
U.S. Cl. 361—308 7 Claims

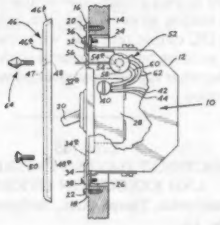


1. A capacitor assembly, which comprises:
a box formed of dielectric material and having an open end;
a pair of terminals configured to have (1) blade-like wide sections extending into and laying along opposed walls of the box; (2) laterally extending horizontal wide sections resting on the edges of said opposed walls to form shoulders which support the terminals with the ends thereof spaced from the bottom of the box, and having a flat section extending horizontally for a distance beyond said walls, and (3) narrow sections extending from the laterally extending wide sections in generally normal directions away from the open end of the box and extending beyond the said opposed walls of the box; and
a rolled metallized film capacitor blank positioned within said box and having a pair of heat fusible termination blocks bonded to the ends of the blank and to the wide sections of the terminals extending into said box to support the capacitor with a clearance between the capacitor and the bottom of the box.

4,255,780
ILLUMINATION ASSEMBLY FOR USE WITH ELECTRICAL TERMINAL UNITS

Peter C. Sakellaris, 7315 SW. 33rd, Portland, Oreg. 97219

Filed Jun. 14, 1979, Ser. No. 48,491
Int. Cl.³ H01H 9/18; F21V 33/00
U.S. Cl. 362—32 13 Claims

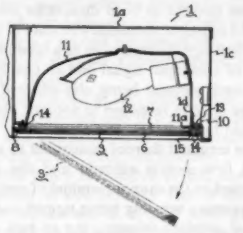


1. In an electrical terminal unit for mounting on a wall having a removable cover plate positioned in front thereof, an illumination assembly for facilitating visual determination of the situs of the unit comprising:
a light source mounted adjacent the unit and behind the cover plate operable for producing illumination;
optical fiber means communicating with said light source for transmitting illumination outwardly from the cover plate, said optical fiber means being dimensioned lengthwise for extending adjacent an aperture provided in the cover plate which normally accommodates reception of a fastener for mounting the cover plate adjacent the unit; and
transparent display means disposed adjacent the end of said optical fiber means which extends adjacent the cover plate for concentrating illumination transmitted by said optical fiber means.

4,255,781
LUMINAIRE LATCH DEVICE

Jerry R. Plemmons, Asheville, and Walter R. Blake, Hendersonville, both of N.C., assignors to General Electric Company, Schenectady, N.Y.

Filed Jul. 25, 1979, Ser. No. 60,584
Int. Cl.³ F21V 17/00
U.S. Cl. 362—374 10 Claims

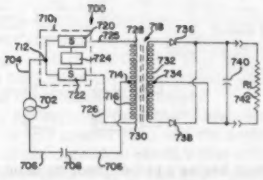


9. A luminaire comprising, in combination, a housing having a top wall and side walls forming an enclosure, said side walls defining a bottom opening, a reflector mounted within said housing enclosure, means for mounting a light source in said enclosure adjacent said reflector, closure means mounted on said housing for movement between a closed position covering said bottom opening and an open position away from said opening, and latch means for detachably holding said closure means in closed position, said latch means comprising a pair of spaced elongated spring members having upper ends secured to one of said housing walls inwardly of said opening and having lower ends extending exteriorly of said opening, said spring members being formed with retaining portions adjacent said bottom opening and being biased inwardly away from said one wall for engagement of said retaining portions with said closure means, and a bar member extending between and secured to said exterior lower ends of said spring members, said bar member being operable for simultaneously moving said spring members outwardly for detaching said closure means from said housing.

4,255,782
ELECTRICAL ENERGY CONVERSION SYSTEMS

Michael F. Joyce, Chicago, Ill., assignor to JGF, Incorporated, Chicago, Ill.

Filed Nov. 15, 1977, Ser. No. 851,686
Int. Cl.³ H02M 5/04
U.S. Cl. 363—8 17 Claims



1. A power supply unit adapted for connection to a source of alternating current providing an alternating current input signal and adapted to provide an output signal having an increased frequency and a maximum output voltage which is

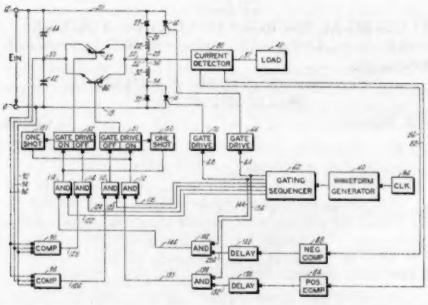
substantially independent of the voltage and frequency of said input signal, said power supply comprising a primary circuit portion, a secondary circuit portion, and a transformer operatively coupling said primary circuit portion to said secondary circuit portion, said transformer including a primary winding and a secondary winding, said primary circuit portion comprising said transformer primary winding, a capacitor, and bilateral switch means in series with said capacitor, said switch means comprising first and second switch elements arranged parallel to each other and having a common input terminal and first and second, non-common output terminals, a flip-flop device having an output terminal connected to each switch element so as to supply an enabling and disabling signal to each of said switch elements, said switch elements each being adapted to pass current in both directions therethrough and each adapted to switch to a conductive state in the conjunctive presence of a first signal responsive to a change in at least one characteristic of said input signal and an enabling signal from said flip-flop, each element being also adapted to switch to a non-conductive state in response to another change in a characteristic of said input signal, said transformer primary winding having one terminal thereof connected to said output terminal of said first switch element and the other terminal thereof connected to the output terminal of said second switch element, said primary winding being tapped and having means connecting said primary winding tap to said capacitor, said first switch element being thereby associated with a first portion of said primary winding and said second switch element being associated with a second portion of said primary winding, said secondary circuit portion including, in addition to said secondary winding, means for connecting the terminals of said winding to an electrical load so as to apply the signal created in said secondary circuit to said electrical load, said primary circuit being arranged so that, in use, said first and second switch elements, under the control of said flip-flop operate so as to alternately energize said first and second primary winding portions when said input signal is positive-going and also to alternately energize said first and second primary winding portions when the said input signal is negative going.

4,255,783

SELECTIVE COMMUTATION CIRCUIT FOR AN INVERTER

Gordon J. Messer, Tolland, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed May 30, 1979, Ser. No. 43,915
Int. Cl.³ H02M 7/515
U.S. Cl. 363—96 **7 Claims**



1. An inverter having a pair of input buses on which electrical energy is received from a DC source for transformation to alternating electrical energy at an output node, comprising:

main switch means responsive to a control waveform for alternatively connecting each input bus to said output node, said switch means not translatable to the nonconducting state unless there is a minimal current therethrough;

commutation means for storing electrical energy and for providing a pulse of energy to said output node, if required, in response to said control waveform so that said switch means can transition to the nonconducting state; and

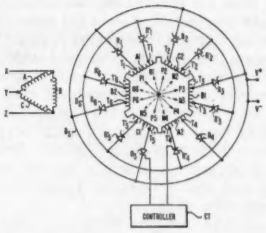
means for sensing current flow through said main switch means, and for actuating said commutation means only in the event that said semiconductor switch means has more than a minimal current therethrough.

4,255,784

TRANSFORMER-RECTIFIER APPARATUS

John Rosa, Pittsburgh, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Nov. 8, 1979, Ser. No. 92,867
Int. Cl.³ H02M 7/155
U.S. Cl. 363—129 **13 Claims**



1. In a system for converting three-phase alternating current (AC) power into direct current (DC) derived between a positive and a negative DC output terminal, the combination of:

a transformer having, (1) three primary windings connected to the respective phases of said AC power; (2) six identical secondary windings connected into a closed regular hexagon, with two secondary windings for one primary winding; (3) a total of twelve taps on said secondary windings distributed at substantially identical central angles on said regular hexagon, with a pair of taps for each secondary winding;

a rectifier circuit having twelve rectifier devices operatively connected in two groups, one positive group to the positive DC output terminal and one negative group to the negative DC output terminal; with one tap of each pair of taps of a winding being associated with one rectifier of one group, the other tap being associated with a rectifier of the other group.

4,255,785

MICROPROCESSOR HAVING INSTRUCTION FETCH AND EXECUTION OVERLAP

George P. Chamberlin, Tempe, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Sep. 25, 1978, Ser. No. 946,221
Int. Cl.³ G06F 9/38
U.S. Cl. 364—200 **7 Claims**

1. An integrated circuit data processor capable of executing in an overlapping manner a plurality of macroinstructions stored in a memory in accordance with a plurality of machine cycles, the data processor also being capable of reading data operands from the memory containing the plurality of instructions, comprising:

(a) an address register for storing a first address of a first instruction during a first machine cycle and for storing a second address of a second instruction during a second machine cycle,

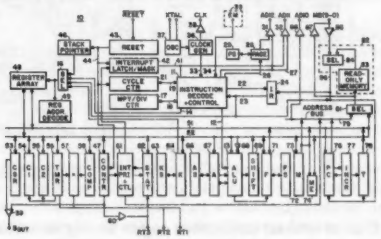
(b) an instruction register for storing the first instruction

during the second machine cycle and for storing the second instruction during a third machine cycle,

(c) a memory bus coupled to said address register and to said instruction register for transferring the first and second addresses from said address register to the memory, said memory bus also being for transferring the first and second instructions from the memory to said instruction register,

(d) timing means coupled to said address register and to said instruction register for effecting the first, second and third machine cycles,

(e) means coupled to said instruction register and to said timing means for executing the first and second instructions, said means effecting execution of the first instruction during the second machine cycle,



(f) a data operand address register having an output coupled to said memory bus for providing to the memory bus the address of a data operand stored in the memory,

(g) means for storing the data operand addressed by said data operand address register, said storing means having an input coupled to said memory bus for receiving from the memory bus the data operand from the memory, and

(h) a read-only memory coupled to said address register and to said instruction register for storing a plurality of instructions for determining a sequence of operations to be performed by said data processor.

4,255,786

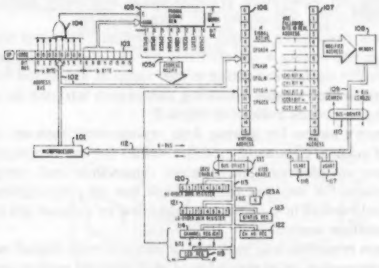
MULTI-WAY VECTORED INTERRUPT CAPABILITY

Thomas O. Holtey, Newton, and Kin C. Yu, Burlington, both of Mass., assignors to Honeywell Information Systems Inc., Waltham, Mass.

Filed Jan. 2, 1979, Ser. No. 402

Int. Cl.[3] G06F *9/22, 9/32*

U.S. Cl. 364—200 **6 Claims**



1. A computer system having a central processing unit (CPU) for generating I/O instruction signals, and a plurality of peripheral subsystems, each having a microprocessor including a program counter, a memory for storing a plurality of absolute address signals indicative of an address location of one of a plurality of interrupt routines stored in said memory, a multiway vectored interrupt apparatus for selecting said address location of said one of said plurality of interrupt routines comprising:

(a) first means coupled to said CPU and said microprocessor and responsive to said I/O instruction signals for enabling said microprocessor for generating first address signals and second address signals;

(b) second means coupled to said microprocessor and said memory and responsive to said first address signals for addressing a first address location in said memory for storing a first portion of a selected one of said plurality of absolute address signals for transfer to said program counter;

(c) third means coupled to said CPU and said microprocessor and responsive to said I/O instruction signals for modifying said second address signals for generating base address signals for addressing an address location in said memory storing a second portion of said selected one of said plurality of absolute address signals for transfer to said program counter;

(d) fourth means coupled to said memory and said Program Counter for transferring said first portion and said second portion of said selected one of said plurality of absolute address signals to said program counter;

said second means being responsive to said first portion and said second portion of said selected one of said plurality of absolute address signals stored in said program counter for addressing said memory for reading out said one of said plurality of interrupt routines for use by said microprocessor.

4,255,787

SYSTEM AND METHOD FOR CONTROLLING THE POWER GENERATED BY A SYSTEM OF HYDRO-PLANTS AND THERMAL UNITS

Arthur G. Hoffmann; Robert P. Guberman, and Larry E. Horner, all of Pittsburgh, Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Continuation of Ser. No. 328,194, Jan. 31, 1973, abandoned. This application Feb. 14, 1975, Ser. No. 550,029

Int. Cl.[2] G06F *15/20;* G05B *19/00*

U.S. Cl. 364—494 **38 Claims**

1. A hydro-thermal power generating system comprising:

(a) a plurality of hydro plants disposed upon at least one river system, and a plurality of thermal units, operated so that a scheduled load for said hydro-thermal power generating system is met;

(b) means for measuring the water released upon the one river system and the inflow and outflow of water into and out of said hydro plants on the one river system;

(c) control means including sequencing means having the following components:

(1) means responsive to the water measuring means for determining the water flowthroughs of each of said hydro plants,

(2) means for selecting one of said hydro plants as a control plant and the remaining hydro plants on the one river system as dependent plants,

(3) means for constructing artificial working curves for said dependent plants based upon the characteristic working curves of said control plant,

(4) means for allocating the water flow through said control plant and said dependent plants by adjusting the working curves of said control plant for a first value of lambda for a selected period to utilize substantially the value of the released water supply,

(5) means for deriving from the characteristic working curves of said control plant and the artificial working curves of said dependent plants, a first value of the total hydro generation of all of said hydro plants on the one river system,

(6) means for substracting the first value of the total hydro generation from the scheduled load of said hydro-thermal power generating system to determine the thermal generation by said thermal units required to meet the

scheduled load of said hydro-thermal power generating system,

(7) means for dispatching said thermal units to calculate therefrom a second value of lambda for the selected period,

(8) means for inserting the second value of lambda derived from the thermal dispatch into said allocating and control means to determine a second value of total hydro generation,

(9) means for comparing the first and second values of hydro generation to determine whether the difference therebetween is within selected limits and closure is met;

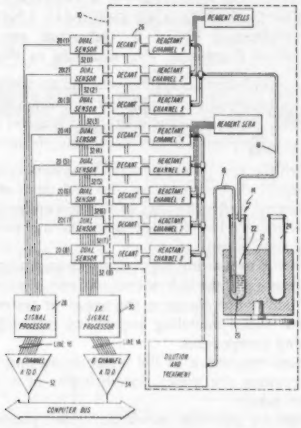
(d) means for applying output signals when closure is met, to selected of said hydro units to effect operation of said hydro units to generate hydro power in accordance with the released water supply; and

(e) means for applying output signals to said thermal units to effect operation of said thermal units to generate the determined thermal generation.

4,255,788
PHASING DETECTOR FOR CONTINUOUS FLOW SYSTEMS

P. Christopher Schwartz, Beltsville, and Richard I. Spielberg, Rockville, both of Md., assignors to American National Red Cross, Washington, D.C.

Filed Mar. 1, 1979, Ser. No. 16,532
Int. Cl.³ 356 *39*; G01N *33/48*
U.S. Cl. 364—416 **12 Claims**



1. In a continuous flow test system, having a plurality of sensor channels, each channel including means for providing an output related to a characteristic to be measured in said channel, an apparatus for phasing data output from those channels when the time delay of sample flow through a channel varies, said apparatus comprising:

a phasing sample, introducable into said sample flow in said channels, having a detectable characteristic;

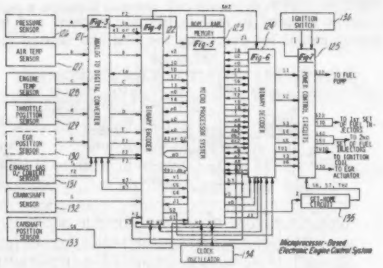
means for detecting and providing an indication of the presence of the phasing sample in each of said channels; and

data processing means, responsive to said indication, for measuring and reporting the time delay of said phasing sample through each channel and correlating the time delays of each channel with output from said means for providing, said data processing means providing said characteristics to be measured in each channel at a predetermined time regardless of variations in time delays among channels.

4,255,789
MICROPROCESSOR-BASED ELECTRONIC ENGINE CONTROL SYSTEM

Thomas W. Hartford, Livonia; Edwin A. Johnson, Clarkston, both of Mich., and Frank A. Russo, Williamsburg, Va., assignors to The Bendix Corporation, Southfield, Mich.

Filed Feb. 27, 1978, Ser. No. 881,321
Int. Cl.³ F02D *5/00*; F02B *3/02*; F02P *5/04*; G05B *15/02*
U.S. Cl. 364—431 **22 Claims**



1. In an internal combustion engine having an intake system an exhaust system, an engine block, a plurality of cylinders disposed in said engine block, a piston mounted for reciprocal movement in each of said plurality of cylinders in response to the combustion of air shaft responsive to the reciprocation of said pistons in said cylinders for being drivably rotated thereby, throttle means disposed in said intake system for controlling the air flow into said plurality of cylinders, means responsive to a fuel control signal for selectively supplying a controlled quantity of fuel into a selected one or more of said plurality of cylinders, means responsive to an ignition control signal for selectively controlling the time and duration of the ignition of said fuel in said selected one or more of said plurality of cylinders, means coupling said exhaust system to said intake system for establishing an exhaust gas recirculation path therebetween, means disposed at least partially within said recirculation path and responsive to an exhaust gas recirculation control signal for selectively varying the quantity of exhaust gas recirculated from said exhaust system back to said intake system, an improved electronic engine control system comprising:

means for sensing a plurality of selected engine operating parameters and generating a conditioned sensor output signal indicative of the value of each of said sensed plurality of selected engine operating parameters;

means for generating predetermined command signals to control the processing said output signal;

means responsive to said predetermined command signals for converting a selected one of said conditioned sensor output signals indicative of the value of a selected one of said sensed engine operating parameters into one or more digital words indicative thereof;

memory means for storing data representing look-up tables of control command modifier values for use in computing one or more engine control commands and program means for implementing at least one of preprogrammed fuel control law, ignition control law or exhaust gas recirculation control law;

means responsive to said one or more of said digital words representative of the value of said selected engine operating parameters for addressing said memory means for one or more of said stored look-up tables of modifier values;

computing means including means responsive to each of said addressed look-up tables for computing one or more desired modifier values, said computing means further including program execution means for generating said predetermined command signals and for implementing said at least one pre-programmed control law utilizing

said computed modifier values for calculating one or more digital command words indicative of a desired control action to be taken for effecting a predetermined engine control function; and

means responsive to said one or more digital command words for generating a precisely controlled value of at least a selected one of said fuel control signal for selectively controlling the quantity of fuel supplied to a selected one or more of said plurality of cylinders, said ignition control signal for selectively controlling the time and duration of the ignition of said fuel in said selected one or more of said plurality of cylinders, and said exhaust gas recirculation signal for selectively varying the quantity of exhaust gas recirculated from said exhaust system back to said intake system.

6. In an internal combustion engine having an engine block, a plurality of cylinders disposed in said engine block, a piston disposed in each of said cylinders and mounted for reciprocal movement in response to the combustion of air and fuel in said cylinder, an output shaft responsive to the reciprocation of said pistons within said cylinders for drivably rotating same, means for selectively controlling the supply of fuel to one or more of said plurality of cylinders, means for generating an ignition pulse for controlling the ignition timing and ignition dwell time and therefore the ignition of said fuel within said cylinders, and a microprocessor-based engine control system for controlling the generation of said ignition pulse, said engine control system further comprising:

sensor means operatively associated with said engine for generating an engine position pulse each time one of said pistons is near the top-dead-center position of its associated cylinder;

program means for computing a first digital ignition control word indicative of ignition delay time and a second digital ignition control word indicative of ignition pulse-width;

means responsive to said first and second digital ignition control words for electronically controlling the generation of said ignition control pulse for ignition timing purposes during normal engine operation; and

means for detecting an engine cranking mode of operation for automatically switching the ignition timing from the control of said microprocessor-based engine control system and generating a first command signal; and

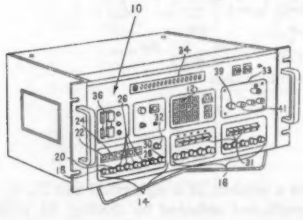
means responsive to said first command signal for mechanically controlling the generation of said ignition control pulse and therefore ignition timing throughout said cranking mode of operation.

4,255,790

PROGRAMMABLE PULSE GENERATING SYSTEM

Luc M. Hondeghem, 128 Caribe Isle, Novato, Calif. 94947

Filed Sep. 25, 1978, Ser. No. 945,585
Int. Cl.³ G01R *13/20*
U.S. Cl. 364—487 **10 Claims**



1. A waveform generating system, which comprises:

(a) means for generating waveforms during a plurality of time periods, each including sub-intervals,

(b) waveform generation control means connected to said waveform generating means for defining the characteristics of the output waveform during each sub-interval,

(c) timing means connected to said waveform generation control means for defining the periods and sub-intervals,

(d) means for entering information into the system to define the periods, sub-intervals and characteristics of the output waveform, and

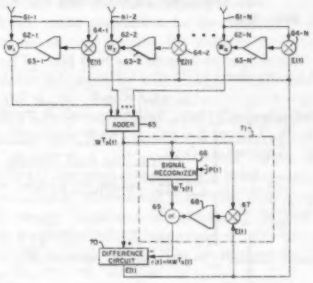
(e) system control means connected to said information entering means, timing means and waveform generation means.

4,255,791

SIGNAL PROCESSING SYSTEM

Gayle P. Martin, Indialantic, Fla., assignor to Harris Corporation, Melbourne, Fla.

Filed Dec. 4, 1978, Ser. No. 965,778
Int. Cl.³ H04B *3/14, 1/10*
U.S. Cl. 364—514 **43 Claims**



10. In a communication system wherein transmitted signals containing an information component, unknown at a receiver site, are received at said receiver site, said receiver site including signal recovery means for recovering, from among the received signals which include a noise component, said unknown information component absent said noise component, the improvement wherein said signal recovery means includes

an input to which a received signal containing said unknown information component and a noise component is applied;

first means for generating a prescribed reference signal the contents of which are defined exclusive of said unknown information signal;

second means, coupled to said input and said first means, for multiplying said prescribed reference signal by said received signal and producing therefrom a first product signal;

third means, coupled to said second means and exclusive of a bandpass filter means, for delaying said first product signal by a prescribed period of time; and

fourth means, coupled to said first means and said third means, for multiplying the delayed first product signal by said prescribed reference signal and producing therefrom a second product signal as an output signal containing an information component that is effectively correlated with the unknown information component contained in said received signal and a noise component that is effectively uncorrelated with any other signal.

42. In a communication system wherein a transmitted signal is received at a plurality of receiving element at a receiver site, said receiver site including means, coupled to said plurality of receiving elements, for producing a received summation signal representative of the sum of a plurality of received signals, an inproved method for controlling the operation of said system so as to maximize said received summation signal with a sequence of signals comprising the steps of:

(a) combining said received summation signal with a prescribed reference signal corresponding to a known com-

ponent of each of said received summation signal and sequence of signals and producing therefrom a summation of said sequence of signals;

(b) generating a correlation signal by correlating said received summation signal with an error signal;

(c) generating a product signal by multiplying said error signal by said summation of said sequence of signals produced in step (a); and

(d) generating a difference signal by subtracting the product signal produced in step (c) from said received summation signal to thereby produce said error signal.

4,255,792

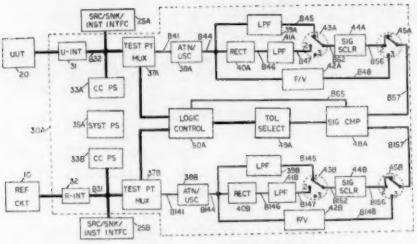
AUTOMATED ANALOG CIRCUIT TEST SYSTEM

Pawan K. Das, 74-153 Country Club Rd., Fatontown, N.J. 07724

Filed Oct. 13, 1978, Ser. No. 953,278

Int. Cl.[3] G06F *11/00*; G01R *31/02*

U.S. Cl. 364—580 **22 Claims**



1. A device for testing a circuit having a plurality of test points comprising:

means for applying power to said circuit from a selected one of a plurality of sources;

a signal tolerance comparator means for comparing signals from said test points to reference signals within a presented tolerance band; and

means for sequentially coupling said signal tolerance comparator means to said test points through a signal processing means, said signal tolerance comparator means sequentially providing a signal indicative of whether said signals are within a selected tolerance of said reference signals respectively.

4,255,793

APPARATUS FOR GENERATING NONLINEAR PULSE PATTERNS

Michiyuki Nakamura, Pleasant Hill, Calif., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Jun. 11, 1979, Ser. No. 47,449

Int. Cl.[3] G06F *15/31*; H03K *3/78*

U.S. Cl. 364—701 **19 Claims**

1. Apparatus for converting a first pulse pattern into any one of a plurality of second pulse patterns, comprising:

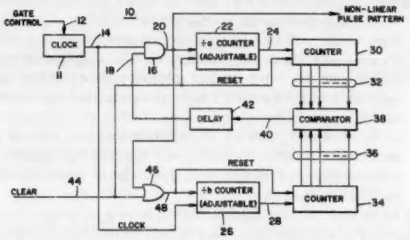
(a) means for generating one of the second pulse patterns in response to pulses of the first pulse pattern;

said generating means including,

first counter means for counting pulses of the desired one of the second pulse patterns,

second counter means for counting pulses of the first pulse pattern, and

means for comparing the count of said first counter means and said second counter means to provide the desired one of the second pulse patterns; and



(b) adjustable means for controlling said generating means to generate any desired one of the second pulse patterns.

4,255,794

DIGITAL FILTER

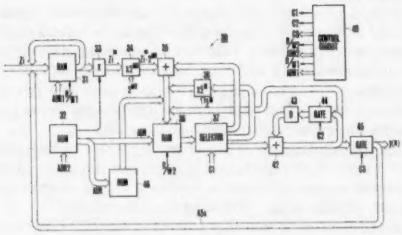
Kenji Nakayama, Tokyo, Japan, assignor to Nippon Electric Co., Ltd., Japan

Filed May 9, 1979, Ser. No. 37,278

Claims priority, application Japan, May 10, 1978, 53-55335; Aug. 16, 1978, 53-100313

Int. Cl.[3] G06F *15/31*

U.S. Cl. 364—724 **12 Claims**



1. A digital filter which performs a filter mathematical operation on input 2N sample values Zi expressed by binary codes in which an output sample y(n) of said filter is expressed by the following equation

$$y(n) = \sum_{i=0}^{2N-1} Ai \cdot Zi = \sum_{i=0}^{2N-1} \left(\sum_{j=1}^{K} aij \cdot 2^{Mo-jM} \right) Zi^{\bullet}$$

$$= \sum_{l=0}^{2^M-1} \left(\sum_{j=1}^{K} S_{jl} \cdot 2^{Mo-jM} \right) l$$

$$= \sum_{l=0}^{2^M-1} S_l \cdot l = \sum_{m=1}^{2^M-1} Sm$$

where the magnitude of

$$Ai = \sum_{j=1}^{K} aij \cdot 2^{Mo-jM}, \; Zi^{\bullet}$$

represents a product of a sign of Ai and Zi, aij represents a partial coefficient obtained by dviding Ai with k, k is the number of groups of partial bits each including M bits, l is an integer between O and 2^M-1, S_{jl} represents a total sum of Zi• corresponding to

$aij = l$ for $(i \doteq 0, 1, 2 \cdot 2N - 1)$,

-continued

$$S_l = \sum_{j=1}^{K} S_{jl} \cdot 2^{Mo-jM},\ m=1,2,\ldots 2^{M-1},\ \text{and}\ \widetilde{Sm} = \sum_{l=M}^{2^M-1} S_l,$$

said digital filter comprising:

first memory means responsive to a plurality of input sample values Zi for storing continuous 2N sample values;

second memory means for storing partial coefficients aij (j<k) which are obtained by dividing each coefficient Ai with K and sign of Ai;

first operational circuit means responsive to said first and second memory means for determining a total sum S_{jl} of sample values Zi stored in said first memory means and relating to l=aij of a partial coefficient aij read out from said second memory means;

shifter means responsive to said first operational circuit means for effectively multiplying by shifting an output S_{jl} of the first operational circuit means by 2^{Mo-jM} where Mo and M are positive integers;

first adder means responsive to an output from the shifter means for cumulatively adding k times an output $2^{Mo-j\cdot M}\cdot S_{jl}$ of the shifter means to obtain

$$\sum_{j=1}^{K} S_{jl} \cdot 2^{Mo-jM} = S_l;$$

second adder means responsive to the results of said first adder means for cumulatively adding (2^M-1m) times the output of the first adder means to obtain

$$\sum_{l=m}^{2^M-1} S_l = Sm$$

and

third adder means responsive to the results of said second adder means for cumulatively adding (2^M-2) times an output of said second adder means to obtain an output y(n) from said filter.

4,255,795

PROGRAMMABLE BINARY CORRELATOR

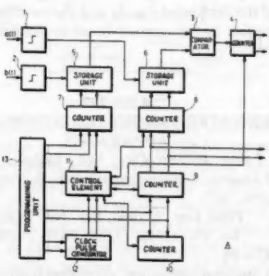
Kurt-Volker Hechtenberg, Eglharting, Fed. Rep. of Germany, assignor to Messerschmitt-Bölkow-Blohm GmbH, Munich, Fed. Rep. of Germany

Filed Nov. 21, 1978, Ser. No. 962,643

Claims priority, application Fed. Rep. of Germany, Nov. 22, 1977, 2752062

Int. Cl.³ G06F *15/34*

U.S. Cl. 364—728 **5 Claims**



1. A programmable binary correlator with one-digit digital sampling comprising:

means for supplying programmed signals;

first and second means each responsive to first and second a(t), b(t) signal inputs for providing sampled, digitized signals;

first and second storage means responsive to said first and second means respectively, said storage means having addressable locations therein;

first and second presettable counters responsive to said programmed signals for determining addresses for causing said sampled, digitized signals to be stored as binary sequences in predetermined addressable locations of said first and second storage means and for calling up said signals bit-by-bit;

clock signal generation means for supplying clock pulses;

control means;

third and fourth counters operating in cooperation with said control means and said programmed signal supplying means, said second counter also responsive to the outputs of the third counter;

said control means responsive to the output of said clock signal generation means and also operating in cooperation with said first and second counters;

a coincidence tester responsive to the outputs of said first and second storage means for comparing said signals provided by said first and second storage means; and

a fifth counter actuated by said control means and responsive to the output of said coincidence tester for increasing the count by one when said coincidence tester indicates coincidence, said fifth counter for providing correlation values of said first and second signal inputs, said programmed signals determining that a predetermined comparative number is obtained from said fifth counter and that the binary sequences are displaced relative to each other in a predetermined manner in which the initial address of the second storage unit is changed by said third counter;

so that said correlator is adapted to again obtain a predetermined comparative number, and to displace said sequences, said obtaining and displacing functions being repeatable as desired and at any storage address.

4,255,796

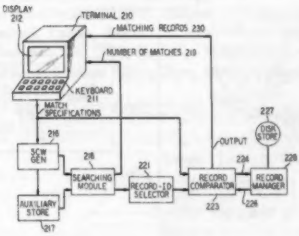
ASSOCIATIVE INFORMATION RETRIEVAL CONTINUOUSLY GUIDED BY SEARCH STATUS FEEDBACK

John D. Gabbe, Little Silver; Charles N. Judice, Lincroft, and Thomas B. London, Tinton Falls, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Feb. 14, 1978, Ser. No. 877,677

Int. Cl.³ G06F *15/40, 7/28;* G11C *15/00*

U.S. Cl. 364—900 **1 Claim**



1. A method of selecting at least one desired record in a collection of records stored in an electronic memory based upon a specification of desired attribute values included in the desired records, including the steps of:

(a) generating an individual binary code group using coding means, the individual binary code having K ONES and b-K ZEROES wherein the position and the number of the K ONES is indicative of each character and each charac-

ter sequence included in the attribute values of each record, the location of the K ONES being determined by said coding means on a pseudo-random, reproducible basis;

(b) combining the individual code groups by logic means in circuit with said coding means to form cumulative code groups and said logic means combining the cumulative code groups to form a superimposed code group indicative of all the attribute values in each record, the superimposed code group having ONES in all locations in which the individual code groups have ONES and ZEROES in the remaining locations;

(c) storing the superimposed code groups and an associated index code for each of the superimposed code groups in an auxiliary electronic memory in circuit with said logic means, each associated index code capable of uniquely locating the related record in the collection of records in said electronic memory;

(d) generating a binary query code group from signals indicative of each character and sequence of characters in the desired attribute values using said coding means and said logic means performing the steps of (a) and (b) above;

(e) examining selected portions of the stored superimposed code groups in the auxiliary electronic memory in response to each of the individual codes using comparing means in circuit with said auxiliary electronic memory to identify partially matching superimposed code groups having ONES in all selected portions, the selected portions corresponding to the locations of the ONES in the query code group;

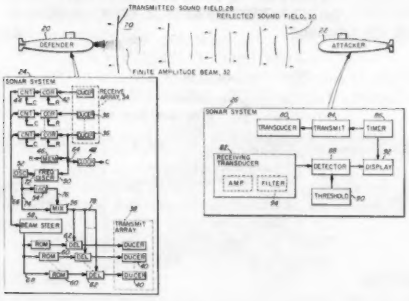
(f) indicating the number of partially matching superimposed code groups by feedback means connected to said comparing means to provide information on the progress of step (e) for each character; and

(g) selecting the related records from the collection of records by accessing means in circuit with said comparing means using the associated index codes to provide the desired records from said electronic memory.

4,255,797
SONIC ATTENUATION SYSTEM

Philip L. Stocklin, Norwich, Conn., assignor to Raytheon Company, Lexington, Mass.

Filed Jul. 5, 1977, Ser. No. 816,231
Int. Cl.[3] H04K *3/00*; G01S *3/80*
U.S. Cl. 367—1 **1 Claim**



1. A sonar system comprising:

means for detecting the direction of a sound wave, said detecting means including means for detecting a frequency of said sound wave;

means for transmitting a beam of acoustic energy of sufficient intensity to induce a nonlinear finite amplitude interaction;

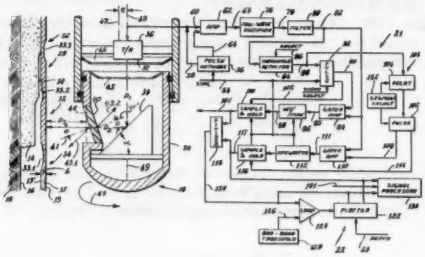
said transmitting means including means for steering said beam, and means coupled to said frequency detection means for providing a transmitting frequency offset from said frequency of said sound wave; and

means coupled between said detecting means and said steering means for signaling said steering means to steer said beam in a direction opposite said detected direction of said sound wave for inducing a nonlinear finite amplitude interaction between said beam and said sound wave.

4,255,798
METHOD AND APPARATUS FOR ACOUSTICALLY INVESTIGATING A CASING AND CEMENT BOND IN A BOREHOLE

R. Mark Havira, New Fairfield, Conn., assignor to Schlumberger Technology Corp., New York, N.Y.

Continuation-in-part of Ser. No. 814,588, Jul. 11, 1977, abandoned. This application May 30, 1978, Ser. No. 911,016
Int. Cl.[3] G01V *1/40*
U.S. Cl. 367—35 **70 Claims**



1. An apparatus for determining characteristics of a casing cemented in a borehole penetrating an earth formation from a reflection signal derived from an acoustic investigation of the casing with an acoustic pulse directed at a radial segment of the casing and formed of acoustic waves at frequencies selected to stimulate a thickness resonance inside the casing walls comprising

means for selecting from the reflection signal a reverberation segment substantially representative of acoustic reverberations between the casing walls at said radial segment;

means for determining the energy in the selected reverberation segment and producing a bond signal indicative thereof to characterize the quality of the cement bond behind said radial segment of the casing; and

means for determining from said reverberation segment the frequency of components contributing to a peak value in the frequency domain of said reverberation segment and generate a casing thickness signal representative thereof as the casing thickness at said radial segment for the evaluation of the cemented casing and the resolution of potential ambiguities in the cement bond evaluation at said radial segment.

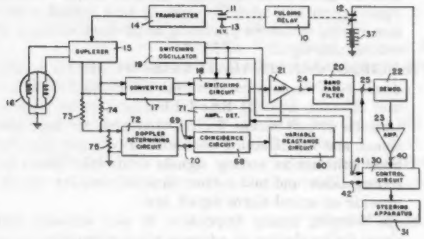
4,255,799
UNDERWATER-TARGET DIRECTION-FINDING APPARATUS

Joseph T. Laing, Ellicott City, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Dec. 7, 1960, Ser. No. 75,061
Int. Cl.[3] G01S *15/88*; F42B *19/01*
U.S. Cl. 367—96 **3 Claims**

1. In an underwater-target direction-finding apparatus of echo-ranging type, in combination: receiver means, including a network tunable to resonance at echo signal frequency, for deriving, from received echo signals, command signals carrying echo-source direction information; target-recognition means for providing a gating signal only upon and during reception of an echo signal arising from a true target, and in

time-coincidence with that echo signal; utilization means controllable by and in response to said command signals when applied thereto; and circuit means for placing said network in



resonant condition in response to and only during occurrence of said gating signal, whereby to limit control of said utilization means to command signals stemming from true target echo signals.

4,255,800

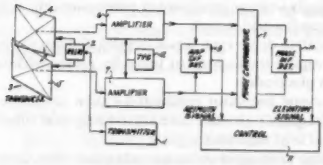
METHOD AND APPARATUS FOR LOCATING UNDERWATER OBJECTS

Franklin G. Patterson, deceased, late of Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Aug. 11, 1959, Ser. No. 833,105

Int. Cl.[3] **G01S** *15/06*

U.S. Cl. 367—99 **4 Claims**



2. In a combination, a transducer for an underwater object locator comprising a plurality of radiating elements, each element comprising a magnetostrictive member having a plurality of separate windings thereon, a first winding of each of said elements being connected in series for radiating a signal, a second winding of a first one-half of said elements being connected in series to form a first channel for receiving reflected signals, corresponding second windings of the other half of said elements being connected in series to form a second channel for receiving reflected signals, means responsive to the difference in amplitude of signals in said channels to provide azimuth information of a reflecting object, and means responsive to the difference in phase of signals in said channels to provide elevation information of such object.

4,255,801

ELECTRONIC WATCH

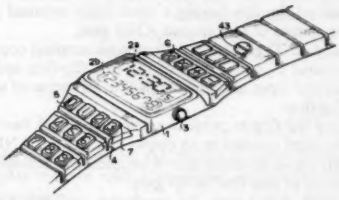
Sadao Ode, Houyd, and Toshikazu Hatuse, Tanashi, both of Japan, assignors to Citizen Watch Co. Ltd., Tokyo, Japan

Continuation of Ser. No. 816,943, Jul. 19, 1977, abandoned. This application Apr. 4, 1979, Ser. No. 27,022

Claims priority, application Japan, Jul. 26, 1976, 51/88898; Jul. 28, 1976, 51/90067

Int. Cl.[3] **G04B** *47/00;* **A44C** *5/14;* **G04B** *37/00*

U.S. Cl. 368—1 D **4 Claims**



1. An electronic watch with a calculation function comprising:

(a) a timepiece circuit having a reference oscillation source, a frequency divider and a time display driving circuit;

(b) a computation circuit for performing the calculation function having a computation display driving circuit;

(c) a display device connected to said time display driving circuit and said computation display driving circuit for displaying a time and a calculation solution;

(d) an external operating member controlling said timepiece circuit and said computation circuit;

(e) an outer casing comprising a case and a band;

(f) an integral flexible hinge connecting said case and said band such that said case is integral with said band;

(g) a conductive patterned film sheet integrally located within said flexible hinge, said case and the band;

(h) a power supply source supplying energy through said conductive patterned film sheet to said timepiece circuit and said computation circuit; and

(i) the electronic watch wherein said flexible hinge, said band and said case are comprised of an integral portion of a high molecular weight polymer which has a narrow region located between said case and said band which flexes and functions as said flexible hinge.

4,255,802

ELECTRONIC TIMEPIECE

Hiroshi Ogawa, Tokorozawa, Japan, assignor to Citizen Watch Company Limited, Tokyo, Japan

Filed Nov. 24, 1978, Ser. No. 963,343

Claims priority, application Japan, Nov. 29, 1977, 52-142949; Dec. 7, 1977, 52-146865

Int. Cl.[3] **G04C** *17/00;* **G04B** *23/02;* **G04C** *9/00*

U.S. Cl. 368—69 **4 Claims**

1. An electronic timepiece having timekeeping means for producing time information, time display means for displaying said time information, a casing including a transparent face

plate disposed to cover said time display means, and setting means comprising:

a plurality of externally actuated touch-sensitive switches;

a first AND gate having a first input terminal coupled to a first one of said externally actuated switches;

a first flip-flop having a clock input terminal coupled to an output of said first AND gate;

a second AND gate having a first input terminal coupled to a second one of said externally actuated switches and a second input terminal coupled to an output of said first flip-flop;

a second flip-flop having a clock input terminal coupled to an output of said second AND gate;

a third AND gate having a first input terminal coupled to the inverse of said output of the first flip-flop and having a second input terminal coupled to an output of said second flip-flop;

a third flip-flop to produce a detection signal, having a clock terminal coupled to an output of said third AND gate and having an inverted output coupled to a second input terminal of said first AND gate;

a fourth AND gate, for producing said selection control signal, having a first input terminal coupled to said first one of said externally actuated switches and a second input terminal coupled to receive said detection signal;

a fifth AND gate, for producing said setting signal, having a first input terminal coupled to said second one of said externally actuated switches and having a second input terminal coupled to receive said detection signal;

an OR gate having first, second and third input terminals coupled to output of said third, fourth and fifth AND gates, respectively;

a timer circuit having a control terminal coupled to receive an output of said OR gate; and

a differentiator circuit coupled to an output of said timer circuit and having an output connected to reset terminals of said first, second and third flip-flops.

4,255,803
ELECTRONIC TIMEPIECE EQUIPPED WITH ALARM FUNCTION

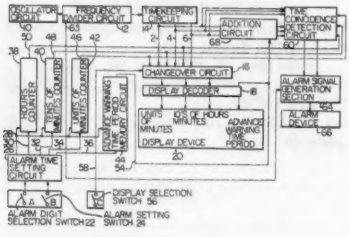
Mitsuo Sekine, Tokorozawa, Japan, assignor to Citizen Watch Company Limited, Tokyo, Japan

Filed Jul. 3, 1978, Ser. No. 921,508

Claims priority, application Japan, Jul. 6, 1977, 52-79813; Jul. 9, 1977, 52-82263

Int. Cl.³ G04B *23/02*

U.S. Cl. 368—72 **4 Claims**



1. An electronic timepiece comprising:

means for producing a standard frequency signal;

frequency divider circuit means responsive to said standard frequency signal for producing a time unit signal;

timekeeping circuit means responsive to said time unit signal for producing current time information signals;

alarm time setting circuit means for providing alarm time information setting signals;

display means responsive to said current time information signals and said alarm time information setting signals for selectively displaying a current time information and an alarm time information;

means for storing advance warning time period information in response to one of said alarm time information setting signals;

addition circuit means responsive to said current time information signals from said timekeeping circuit and to output signals from said advance warning time period information storing means for providing an advance warning time information signal;

coincidence detection circuit means for detecting coincidence between said current time information signals and said advance warning time information signal from said addition circuit means for providing an advance alarm signal, and for detecting coincidence between said alarm time information setting signals from said alarm time setting means and said current time information signals to provide an actual alarm signal; and

alarm warning means responsive to said advance alarm signal for producing an advance alarm time warning, and responsive to said actual alarm signal for producing an actual alarm time warning.

4,255,804
ELECTRONIC WATCH

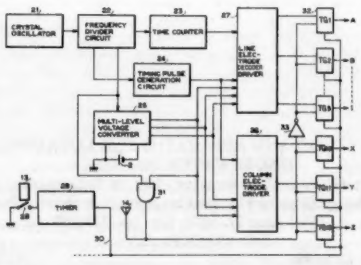
Kunio Suganuma, Tokorozawa, Japan, assignor to Citizen Watch Company Limited, Tokyo, Japan

Filed Feb. 23, 1978, Ser. No. 880,592

Claims priority, application Japan, Mar. 1, 1977, 52-21998

Int. Cl.³ G04C *19/00*

U.S. Cl. 368—84 **6 Claims**



1. An electronic watch comprising:

(a) a single voltage level power source serving as the energy source for said watch;

(b) a matrix drive type liquid crystal display device providing digital indications of times by means of line and column electrodes;

(c) a crystal oscillator producing a time reference signal;

(d) a frequency divider circuit dividing said time reference signal into time unit signals;

(e) a time keeping counter counting said time unit signals to provide a time keeping signal;

(f) matrix drive circuit means converting said time keeping signal into drive signals for said line and column electrodes, said matrix drive circuit means comprising a voltage converter providing multi-level voltages for driving said line and column electrodes by employment of said single voltage level power source as the energy source, timing signal generation means receiving the output from a portion of said frequency divider circuit as the input and providing a matrix drive timing signal as the output, a line electrode drive switching said multi-level voltages with said timing signal to form output wave forms which are selectively indicative and non-indicative of said line electrodes, and a column electrode driver switching said multi-level voltages with said timing signal and time keeping signal to form a column electrode drive wave; and

(g) pitch measurement signal transmission means including conversion means for converting at least some of said line and column electrode drive signals into the same wave form and drive mode switching means for producing a signal for momentarily operating said conversion means.

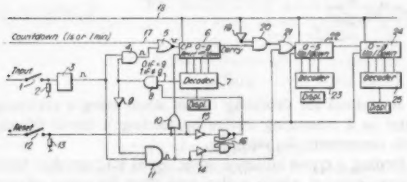
4,255,805
DATA INTRODUCING ARRANGEMENT

Jean-Pierre Jaunin, La Neuveville, Switzerland, assignor to Societe Suisse Pour l'Industrie Horlogere Management Services S.A., Bienne, Switzerland

Continuation-in-part of Ser. No. 897,603, Apr. 18, 1978, abandoned. This application Mar. 27, 1979, Ser. No. 24,299

Int. Cl.³ G04F *3/06*; G04C *9/08*

U.S. Cl. 368—108 **11 Claims**



1. A data introducing arrangement including a quantity measuring count-down digital display device for displaying a plurality of ordered columns of digits representative of the quantity, such as a timer, comprising:

a multi-stage down counting means having a group of counting stages for each ordered digit column to be displayed, said multi-stage down counting means being set to a predetermined set count by activating stage groups of said multi-stage down counting means with setting pulses until said predetermined set count is reached, and said multi-stage down counting means measuring said quantity by thereafter counting downwardly, from said predetermined set count, pulses representative of said quantity;

a setting pulse producing system for initially feeding setting pulses to a stage group corresponding to a lower order digit column when said multi-stage down counting means is being set at said predetermined set count;

a logic means connected between said pulse producing system and said down counting means to block setting pulses fed to said stage group corresponding to said lower order digit column and to thereafter bypass said lower order stage group to feed said setting pulses to a stage group of a higher order digit column in response to said lower order stage group reaching a predetermined trigger count unrelated to said set count.

4,255,806
DISPLAY MEANS FOR CHRONOMETERS WITH ELECTRO-OPTICAL ELEMENTS

Kurt Fahrenschon, Kelkheim, and Friedrich W. Nickol, Eppstein, both of Fed. Rep. of Germany, assignors to Braun Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

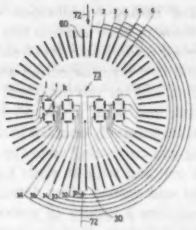
Filed Feb. 8, 1979, Ser. No. 10,643

Claims priority, application Fed. Rep. of Germany, Feb. 10, 1978, 2805646

Int. Cl.³ G04C *17/02*

U.S. Cl. 368—240 **9 Claims**

1. In a display for an electronic chronometer having an analog electro-optical display comprising a plurality of segment electrodes radially disposed about a center point and at least one first counterelectrode bridging at least two radial segment electrodes and a digital electro-optical display comprising a plurality of digit electrodes which define at least one alphanumeric character and at least one second counterelectrode, the improvement wherein at least two first counterelectrodes each has a different set of radial segment electrodes associated therewith and means electrically connecting at least one radial segment electrode of one set in parallel with one radial segment electrode of the other set and in parallel with one digit electrode, whereby the display may be driven in a time multiplex manner with a minimum number of external display connections.



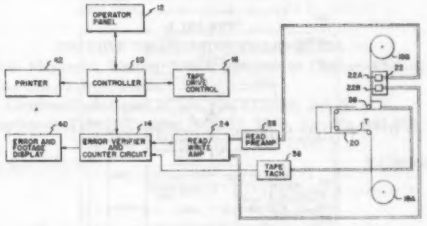
4,255,807
ERROR TESTING OF RECORDING MEDIA SUCH AS MAGNETIC TAPE

Phillip A. Cosby, Arlington, Tex., assignor to Graham Magnetics Incorporated, North Richmond Hills, Tex.

Filed Dec. 18, 1978, Ser. No. 970,666

Int. Cl.³ G01R *31/28*; G06F *11/00*

U.S. Cl. 371—21 **26 Claims**



1. Apparatus for testing and evaluating errors in a recording medium of the type including a plurality of separate recording tracks, said apparatus comprising:

(a) means to sense errors in respective tracks of the medium;

(b) means responsive to said error sensing means to store for each sensed error a signal representative of the error and of the track in which the error occurs;

(c) means responsive to said error sensing means to define for each sensed error a preselected error evaluation segment of the medium which segment includes that error; and

(d) means to process for each sensed error the signal representative of that error and its track and the signals representative of other errors sensed in other tracks of the medium within the preselected error evaluation segment associated with that error to categorize that error as

(1) a one-track error,

(2) a two-track error, or

(3) a three-track error.

4,255,808
HARD OR SOFT CELL FAILURE DIFFERENTIATOR

Scott D. Schaber, St. Paul, Minn., assignor to Sperry Corporation, New York, N.Y.

Filed Apr. 19, 1979, Ser. No. 31,574

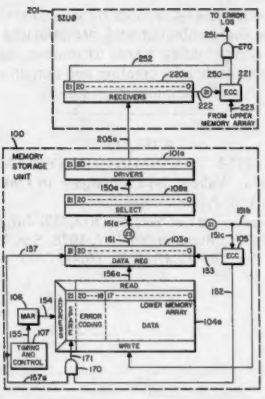
Int. Cl.³ G06F *11/08*; G11C *29/00*

U.S. Cl. 371—38 **7 Claims**

1. In a data processing system with a memory storage unit

having a memory bank containing a plurality of addressable locations from which data may be read and having a first error detecting and correcting means responsively coupled to said memory bank for detecting errors in said data read from said memory bank and correcting said data for rewrite into said memory bank and having regeneration means responsively coupled to said memory bank and said first error detecting and correcting means for reading said data from said memory bank, for permitting said first error detecting and correcting means to correct said data, and for rewriting said corrected data into said memory bank and with a second error detection and correcting means responsively coupled to said memory storage unit for detecting and correcting errors in data read from said memory storage unit and with an error logging store responsively coupled to said second error detecting and correcting means which maintains a history of errors detected and corrected by said second error detecting and correcting means, the improvement comprising:

a plurality of storage elements wherein a different one of said plurality of storage elements corresponds to each of said plurality of addressable locations contained within said memory bank wherein said different one of said plurality



of storage elements is read whenever said memory bank is read at a corresponding one of said plurality of addressable locations;

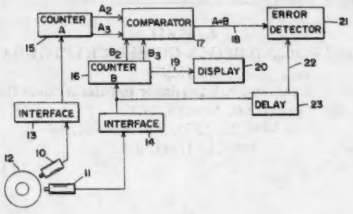
means responsively coupled to said regeneration means, said first error detecting and correcting means, and said plurality of storage elements for setting to first predetermined value said different one of said plurality of storage elements corresponding to one of said plurality of addressable locations of said memory bank whenever said regeneration means reads from said memory bank at said corresponding one of said plurality of addressable locations and said first error detecting and correcting means detects an error in data read from said memory bank at said corresponding one of said plurality of addressable locations; and means responsively coupled to said error logging store, said plurality of storage elements, and said second error detecting and correcting means for inhibiting said error logging store from recording an error detected by said second error detecting and correcting means for which said different one of said plurality of storage elements corresponding to a one of said plurality of addressable locations is not set to said first predetermined value.

4,255,809

DUAL REDUNDANT ERROR DETECTION SYSTEM FOR COUNTERS

Dale A. Hillman, 2523 Lynn Ave. South, St. Louis Park, Minn. 55416

Filed Nov. 2, 1979, Ser. No. 90,555
Int. Cl.[3] G06F *11/16*; H03K *21/34*
U.S. Cl. 371—58 **7 Claims**



1. A method for detecting errors when using a multistage counter as a measuring device by feeding it count advance signals comprising the steps of:

a. feeding a count advance input signal into another multistage counter which is displaced from the count advance input signal being fed into the measuring counter so that the counters do not advance simultaneously;

b. comparing the contents of the two counters except for at least their lowest order counter stages; and

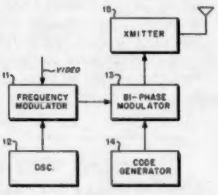
c. counting the instances when the comparison shows a difference and when the comparison shows equality.

4,255,810

JAM RESISTANT FREQUENCY MODULATION SYSTEM

Karl Solomon, Haddonfield, and George C. Hennessy, Haddon Heights, both of N.J., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jan. 13, 1965, Ser. No. 427,208
Int. Cl.[3] H04B *15/00*; H04K *1/00*; H04L *7/00*
U.S. Cl. 375—1 **10 Claims**



1. An interference proof FM video communication system comprising:

means for frequency modulating a carrier frequency by a video signal;

means for bi-phase modulating the output of said frequency modulating means in accordance with a binary code, said phases being 180° apart;

means for transmitting the output signal of said bi-phase modulator;

means remote from said transmitter for receiving said output signal;

means associated with said receiving means for mixing said received signal with a beat frequency signal bi-phase modulated by a generated code substantially identical to said binary code;

means for synchronizing said generated code with said bi-

nary code by comparing a filtered and an unfiltered value of the output of said mixing means;

means for holding said generated code in synchronization with said binary code by correlating said received signal bi-phase modulated according to said generated code with said received signal bi-phase modulated according to a time-delayed version of said generated code; and

means for detecting said video signal from the output of said mixing means.

4,255,811

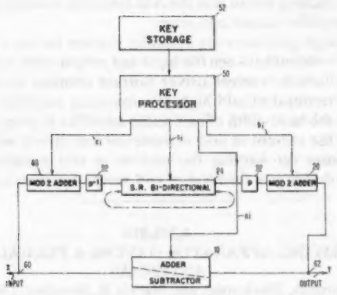
KEY CONTROLLED BLOCK CIPHER CRYPTOGRAPHIC SYSTEM

Roy L. Adler, Ossining, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 25, 1975, Ser. No. 561,760

Int. Cl.³ H04L *9/02*

U.S. Cl. 375—2 **16 Claims**



1. A cryptographic method for encrypting and decrypting an n-bit block of binary data utilizing an initially provided unique binary key, the encryption operation comprising the performance of a plurality (N) of encryption rounds, each round including the transformational operations of addition-with-carry, a first modulo-2 addition, rotational shifting, and a second modulo-2 addition; and wherein each included operation is performed using the n-bit result block of the previous transformational operation together with an n-bit key block derived from said initially provided key material, and wherein said decryption operation is identical to the encryption operation except that the direction of the rotational shifting is reversed and the addition-with-carry becomes subtraction-with-borrow.

4,255,812

SIGNAL REGENERATING APPARATUS WITH DC COMPENSATION

Joseph Hüellwegen, Altenbeken, Fed. Rep. of Germany, assignor to Nixdorf Computer AG, Paderborn, Fed. Rep. of Germany

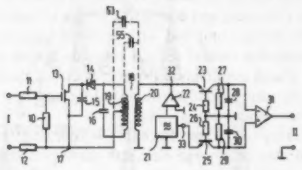
Filed Jun. 18, 1979, Ser. No. 49,150

Claims priority, application Fed. Rep. of Germany, Jun. 16, 1978, 2826536

Int. Cl.³ H04L *25/28*

U.S. Cl. 375—4 **8 Claims**

1. In a communication system having ungrounded lines for transmission of communication signals and signal regenerating apparatus having an ungrounded primary side connected to said transmission line for receiving said communication signals and a secondary side electrically isolated from but inductively coupled to said primary side for furnishing output signals corresponding to said communication signals, said regenerating apparatus comprising resonant circuit means on said primary side, modulation means connected to said resonant circuit means and said transmission line for modulating high frequency oscillations induced in said resonant circuit means in accordance with said communication signals thereby creating modulated high frequency signals across said resonant circuit means, said regenerating apparatus further comprising means connected to said secondary side for generating high frequency signals, means for inductively coupling said high frequency signals to said resonant circuit means thereby inducing said high frequency oscillations therein, and means connected on said secondary side for demodulating said modulated high frequency signals thereby creating demodulated signals corresponding to said communication signals but having an undesired DC component, the improvement comprising



rectifier means connected to said high frequency signal generating means for rectifying said high frequency signals and furnishing a DC compensating signal corresponding thereto; and

means connected to said rectifier means and said demodulating means for combining said demodulated signals and said DC compensating signal to remove said undesired DC component thereby creating said output signals corresponding to said communication signals.

4,255,813

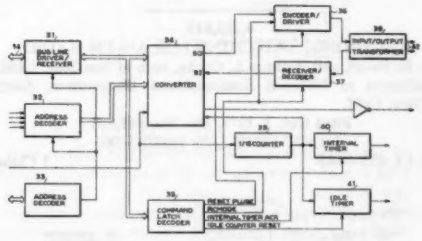
DICODE TRANSMISSION SYSTEM

Seiichi Miyazaki, Wakou, Japan, assignor to Ohkura Electric Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 813,339, Jul. 6, 1977, abandoned. This application Nov. 17, 1978, Ser. No. 961,554

Int. Cl.³ H04B *1/10*; **H04L** *1/00*

U.S. Cl. 375—34 **9 Claims**



1. In an asynchronous transmission system for transmitting a text as dicode signals having start and stop bits, the improvement comprising:

(a) a data holding register for retaining said text to be transmitted and a reset pulse bit, and for sequentially delivering data in a bit-parallel, word-serial form just after transmission of said reset pulse bit;

(b) a parallel-to-serial converter connected to said data holding register for receiving and converting said data to an output serial signal stream having said start and stop bits;

(c) a dicode encoding circuit connected to said parallel-to-serial converter for receiving said output serial signal stream therefrom; and

(d) OR-gating means connected to said data holding register for receiving said reset pulse bit therefrom and connected to said dicode encoding circuit for receiving an output

therefrom; said OR-gating means delivering an output to a transmission line via a line driving circuit.

4,255,814

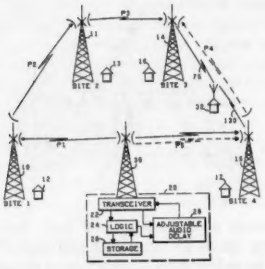
SIMULCAST TRANSMISSION SYSTEM

James L. Osborn, Arlington Heights, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

Continuation-in-part of Ser. No. 815,885, Jul. 15, 1977, abandoned. This application Jun. 11, 1979, Ser. No. 47,508

Int. Cl.³ H04B *1/00*

U.S. Cl. 455—51 **2 Claims**



1. A simulcast transmission system for the simultaneous transmission of information signals comprising:

a plurality of simulcast transmitter sites, each being located at a predetermined position, and each including means for receiving and retransmitting information signals; and

control means for establishing transmission links among said simulcast transmitter sites, said control means including means for receiving said information signals and providing a predetermined time delay thereto for each information signal transmitted over a link such that simultaneous transmissions from overlapping coverage area simulcast transmitter sites, each serviced by a different link, are in phase coherency, said control means further comprising means to store the necessary time delay required for each link and for automatically recalling said stored time delay value and provide the required time delay to signals passed over newly established links.

4,255,815

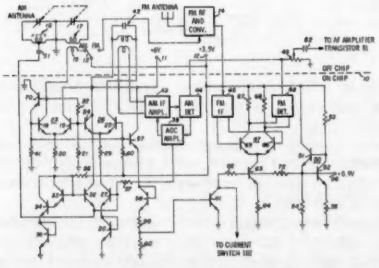
ELECTRONIC SWITCHING FOR AM-FM RADIO

Don R. Sauer, and William A. Cocke, both of San Jose, Calif., assignors to National Semiconductor Corporation, Santa Clara, Calif.

Filed Oct. 2, 1978, Ser. No. 947,981

Int. Cl.³ H04B *1/26*; H03D *5/00*

U.S. Cl. 455—143 **1 Claim**



1. An integrated circuit for performing the signal processing functions of a radio receiver capable of operating on amplitude modulated (AM) and frequency modulated (FM) standard broadcast signals, said receiver comprising an AM signal antenna, an FM signal antenna, intermediate frequency (IF) amplification means, FM amplification and converter means, audio frequency (AF) amplifier means, and single pole means for switching the operation of said receiver between said AM and FM signals, said circuit comprising:

means for converting signals from said AM signal antenna to an IF signal and means for coupling said IF signal to said IF amplification means;

means responsive to said switching means for disabling said means for converting when said switching means is in the FM function;

limiting amplifier means coupled to said IF amplification means and operative to provide signal limiting action on said FM signals;

means responsive to said switching means for disabling said limiting amplifier means when said switching means is in the AM function;

audio amplifier means for amplifying both said AM and FM audio signals; and;

means responsive to said switching means for reducing the bandwidth of said audio amplifier means when said switching means is in the AM function, wherein said audio amplifier means comprise:

a high gain inverting amplifier portion having a capacitor coupled between the input and output terminals thereof;

a variable current driver portion coupled to said input terminal of said high gain inverting amplifier whereby the bandwidth of said audio amplifier is proportional to the current in said variable current driver; and

means for varying the current in said variable current driver as a function of said means for switching.

4,255,816

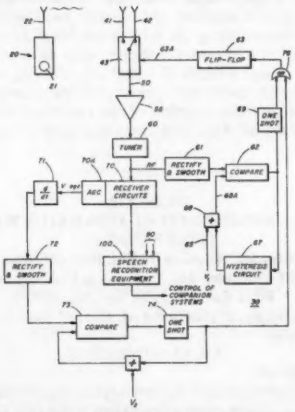
RECEIVING APPARATUS HAVING A PLURALITY OF ANTENNAS

Gene Grunza, Blackwood, and Marvin B. Herscher, Cherry Hill, both of N.J., assignors to Threshold Technology, Inc., Delran, N.J.

Continuation-in-part of Ser. No. 737,510, Nov. 1, 1976, abandoned. This application Sep. 15, 1978, Ser. No. 942,493

Int. Cl.³ H04B *1/06, 7/08*

U.S. Cl. 455—277 **3 Claims**



1. Apparatus for receiving and processing transmitted electromagnetic waves, comprising:

first and second spaced antennas;

a common channel;

switching means for coupling either said first or said second antenna to said common channel;

signal processing means for processing the signals on said common channel, said signal processing means including means for generating an automatic gain control (AGC)

signal which depends upon the instantaneous level of the signal on the common channel;

means for detecting the rate of change of said AGC signal;

means for comparing a signal representative of the rate of change of said AGC signal with a threshold, and for generating a control signal when said signal representative of the rate of change of said AGC signal exceeds said threshold; and

means for applying said control signal to said switching means to effect the switching to the other antenna.

258,470

CONTAINER FOR COSMETICS OR THE LIKE

Ngo C. Chun, 11 Tai Lung St., 20th Fl., Block F, Kwai Lung Bldg., Kwai Chung, Tsuen Wan, Kowloon, Hong Kong

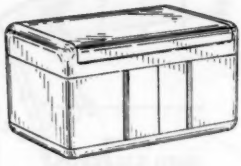
Filed Mar. 30, 1979, Ser. No. 25,713

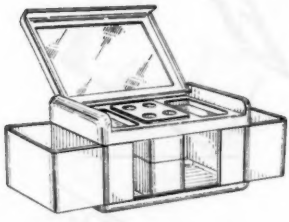
Claims priority, application United Kingdom, Feb. 1, 1979, 988374/79

Term of patent 14 years

Int. Cl. D28—*03*

U.S. Cl. D3—39





258,471

HAND TOTE BAG

David E. Workman, Evergreen, Colo., assignor to Samsonite Corporation, Denver, Colo.

Filed Jan. 30, 1979, Ser. No. 7,786

Term of patent 14 years

Int. Cl. D3—*01*

U.S. Cl. D3—71

258,472

URINAL SCREEN

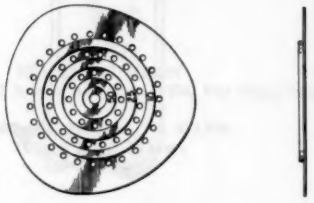
John M. Adam, Marietta, Ga., assignor to NCH Corporation, Irving, Tex.

Continuation-in-part of Ser. No. 950,583, Oct. 12, 1978, Pat. No. Des. 253,146, which is a continuation-in-part of Ser. No. 852,937, Nov. 18, 1977, Pat. No. Des. 253,145. This application Mar. 9, 1979, Ser. No. 18,868

Term of patent 14 years

Int. Cl. D23—*01;* D6—*06*

U.S. Cl. D6—86



258,473

ROTATABLE DISPLAY RACK

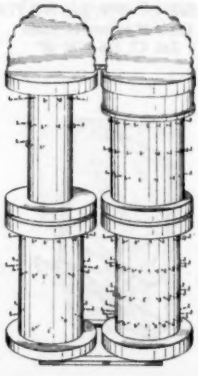
Sydney Edson, New York, N.Y., assignor to Textron, Inc., Providence, R.I.

Filed May 19, 1978, Ser. No. 907,468

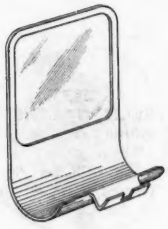
Term of patent 14 years

Int. Cl. D20—*02*

U.S. Cl. D6—85

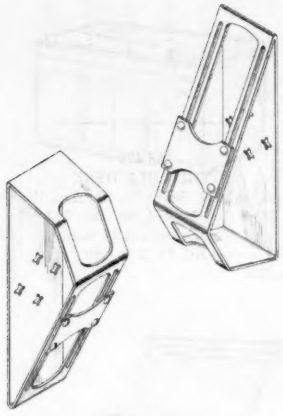


258,474
COMBINED MIRROR AND RAZOR AND SHAVING CREAM HOLDER
Richard Edstrom, 239 E. 58th St., New York, N.Y. 10022
Filed Aug. 2, 1979, Ser. No. 63,064
Term of patent 14 years
Int. Cl. D6—*04, 07*
U.S. Cl. D6—88

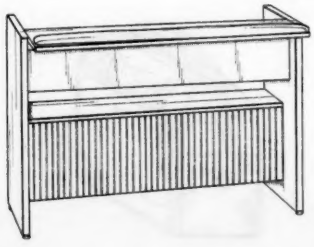


258,475
COMBINED MIRROR AND HOLDER FOR RAZORS
Richard Edstrom, 239 E. 58th St., New York, N.Y. 10022
Filed Sep. 19, 1979, Ser. No. 77,022
Term of patent 14 years
Int. Cl. D6—*04, 07*
U.S. Cl. D6—88

258,476
ADJUSTABLE WALL RACK FOR HOLDING HAIR TREATING DEVICES
Nancy J. Gilboy, 1422 Chestnut St., Philadelphia, Pa. 19102; Katherine J. Helmstadter, 3315 Skyline Dr. Linden Hill, Wilmington, Del. 19808, and John J. Walsh, 1004 Stoneybrook Dr., Jeffersonville, Pa. 19403
Filed Feb. 9, 1979, Ser. No. 10,638
Term of patent 14 years
Int. Cl. D6—*04;* D8—*08*
U.S. Cl. D6—125

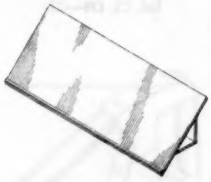


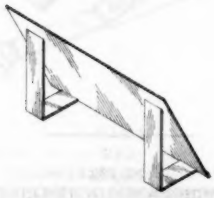
258,477
BAR
Ernest A. Pittman, Courtland, Mich., assignor to Chromcraft Corporation, Amsterdam, N.Y.
Filed Feb. 24, 1977, Ser. No. 771,605
The portion of the term of this patent subsequent to Jun. 24, 1994, has been disclaimed.
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—144



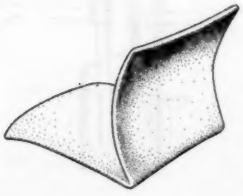
258,478
LIQUOR BAR
Colman Zola, 58 Tamarack Way, Pleasantville, N.Y. 10570
Filed Oct. 27, 1978, Ser. No. 955,410
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—144

258,479
PORTABLE DESK
Henry A. Mills, 1828 N. Sayre St., Chicago, Ill. 60635
Filed Jul. 7, 1978, Ser. No. 922,562
Term of patent 14 years
Int. Cl. D06—*99*
U.S. Cl. D6—184

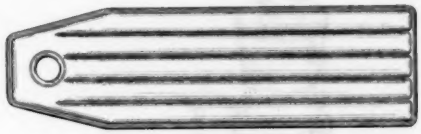




258,480
COMBINED SEAT AND BACKREST UNIT FOR A CHAIR
David L. Rowland, 8 E. 62nd St., New York, N.Y. 10021
Filed May 5, 1978, Ser. No. 903,388
Term of patent 14 years
Int. Cl. D6—*06*
U.S. Cl. D6—200



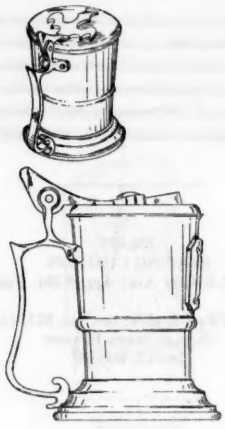
258,481
CHIROPRACTIC MATTRESS, OR SIMILAR ARTICLE
Frederick H. Kroll, 72 Wood Hollow La., New Rochelle, N.Y. 10804
Filed Jan. 25, 1979, Ser. No. 6,299
Term of patent 14 years
Int. Cl. D6—*09*
U.S. Cl. D6—201



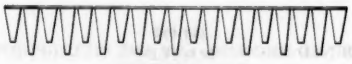
258,482
SEATING CUSHION
Gina Strock, 6727 Sylmar Ave., Apt. #204, Van Nuys, Calif. 91405
Filed Jun. 8, 1978, Ser. No. 913,836
Term of patent 14 years
Int. Cl. D6—*09*
U.S. Cl. D6—204

258,483
COMBINED DRINKING CUP AND MULTI-PURPOSE LID THEREFOR
Hugo O. Weinstein, Hacienda Heights, Calif., assignor to Lawrence I. Miller, North Hollywood, Calif.
Filed Apr. 14, 1978, Ser. No. 896,330
Term of patent 14 years
Int. Cl. D7—*01*
U.S. Cl. D7—6

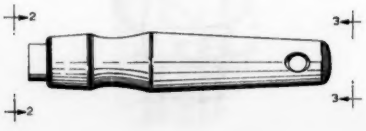
258,484
DRINKING MUG
Frank V. Slepicka, 568 Western Ave., Glen Ellyn, Ill. 60137
Filed Sep. 11, 1978, Ser. No. 941,393
Term of patent 14 years
Int. Cl. D07—*01*
U.S. Cl. D7—9



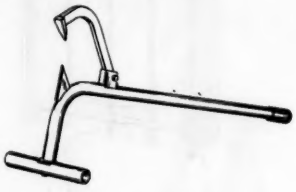
258,485
ANTI-SPILL BEVERAGE DEVICE
Chauncey B. Eller, 23100 Vista Grande Way, Colton, Calif. 92324
Filed Jan. 23, 1978, Ser. No. 871,420
Term of patent 14 years
Int. Cl. D7—*04*
U.S. Cl. D7—47



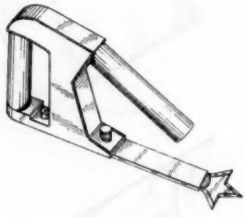
258,486
HANDLE FOR CULINARY TOOLS OR THE LIKE
Edward M. Wallace, Longmeadow; Robert G. Gosselin, Springfield, and Ernest D. Labarre, Holyoke, all of Mass., assignors to Wallace Mfg. Co., Enfield, Conn.
Filed Jun. 7, 1979, Ser. No. 46,353
Term of patent 14 years
Int. Cl. D07—*02*
U.S. Cl. D7—132



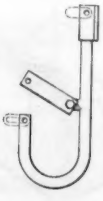
258,487
TOOL FOR GRIPPING AND LIFTING LOGS
Robert E. Brugger, Torrington; Richard H. Bartley, Harwinton; Ernest J. Waldron, Jr., Torrington, and Carl F. Piontkowski, Old Saybrook, all of Conn., assignors to C & D Distributors, Inc., Old Saybrook, Conn.
Filed Nov. 21, 1978, Ser. No. 962,686
Term of patent 14 years
Int. Cl. D7—*08*
U.S. Cl. D7—210



258,488
URETHANE PULL KNIFE AND BLADE
Peter M. Juziuk, Madison Heights, Mich., assignor to Kent-Moore Corporation, Warren, Mich.
Filed Jan. 4, 1979, Ser. No. 839
Term of patent 14 years
Int. Cl. D8—*03*
U.S. Cl. D8—98



258,489
COMBINED BRACKET AND LOCKING SUPPORT HOOK UNIT FOR HOLDING TRUCK TIRE CHAINS WHILE NOT IN USE
Donald G. Gipson, 221 Manzanita Ave., Red Bluff, Calif. 96080
Filed Jan. 15, 1979, Ser. No. 3,714
Term of patent 14 years
Int. Cl. D8—*07, 08*
U.S. Cl. D8—333



258,490

CONTAINER FOR LIQUIDS

Joseph W. Stumler, 125 Franklin Dr., New Albany, Ind. 47150

Filed Apr. 10, 1978, Ser. No. 895,158

Term of patent 14 years

Int. Cl. D9—*01*

U.S. Cl. D9—370

258,491

BOTTLE OR SIMILAR ARTICLE

Thomas H. Hayes, Baton Rouge, La., assignor to Ethyl Corporation, Va.

Filed Apr. 4, 1979, Ser. No. 27,083

Term of patent 14 years

Int. Cl. D9—*01*

U.S. Cl. D9—378

258,492

DECANTER

James E. Plummer, Toledo, Ohio, assignor to Owens-Illinois, Inc.

Filed Sep. 13, 1978, Ser. No. 942,016

Term of patent 14 years

Int. Cl. D9—*01*

U.S. Cl. D9—376

258,493

BOTTLE

James E. Plummer, Toledo, Ohio, assignor to Owens-Illinois, Inc.

Filed May 1, 1978, Ser. No. 901,661

Term of patent 14 years

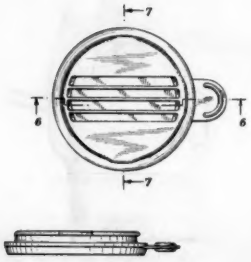
Int. Cl. D9—*01*

U.S. Cl. D9—385

258,494
CONTAINER FOR LIQUIDS
G. Franco Romagnoli, 37 Garfield St., Watertown, Mass. 02172
Filed Jun. 29, 1978, Ser. No. 920,294
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—375

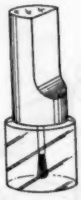
258,495
PACKAGING CONTAINER WITH CAP
Stuart E. Benedict, Pleasantville, N.Y., assignor to Union Carbide Corporation, New York, N.Y.
Filed Jun. 28, 1978, Ser. No. 919,843
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—388

258,496
CONTAINER CLOSURE
Clifford J. Ludwig, Jr., Southgate, Ky., and Walter J. Gerk, Chicago, Ill., assignors to The Drackett Company, Cincinnati, Ohio
Filed Apr. 24, 1978, Ser. No. 899,763
Term of patent 14 years
Int. Cl. D09—*07*
U.S. Cl. D9—439

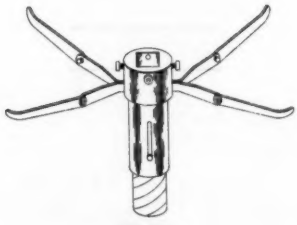


258,497
BOTTLE
Norbert Hartmann, Bigogno, Switzerland, assignor to Pharmaton S.A., Lugano-Bioggio, Switzerland
Filed Nov. 17, 1978, Ser. No. 961,547
Claims priority, application Switzerland, May 28, 1978, 109840/78
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—377

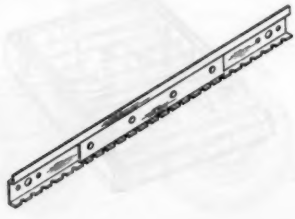
258,498
BOTTLE
Norbert Hartmann, Bigogno, Switzerland, assignor to Pharmator S.A., Lugano-Bioggio, Switzerland
Filed Nov. 17, 1978, Ser. No. 961,548
Claims priority, application Switzerland, May 28, 1978, 109840/78
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—399



258,499
MINE ROOF WARNING INDICATOR
Larry L. Brown, 2802 Corral Dr., St. Louis, Mo. 63010, and Robert G. Hamm, 3905 Shenandoah, St. Louis, Mo. 63110
Filed Dec. 21, 1978, Ser. No. 971,949
Term of patent 14 years
Int. Cl. D10—*06*
U.S. Cl. D10—104

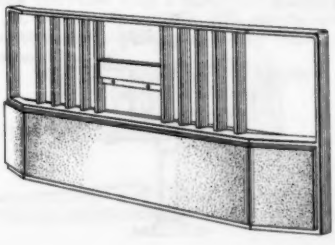


258,500
CONVEYOR SLAT MEMBER OR SIMILAR ARTICLE
Earl W. Kloefkorn, deceased, late of Machester, Okla., and by Melvin L. Kloefkorn, heir, Box 36, Manchester, Okla. 73758
Filed Dec. 20, 1977, Ser. No. 863,343
Term of patent 14 years
Int. Cl. D12—*05*
U.S. Cl. D12—60



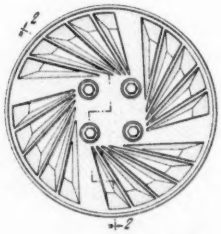
258,501
REVERSIBLE FUEL TANK
Norris C. Winslow, 3345 Galahad Dr., Dallas, Tex. 75229
Filed Jun. 25, 1979, Ser. No. 51,627
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—155

258,502
PUSH BUMPER FOR TOW TRUCKS
Ronald R. Nespor, c/o Chevron, Inc., R.D. #7, Rte. 62, Mercer, Pa. 16137
Filed Oct. 16, 1978, Ser. No. 951,661
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—170

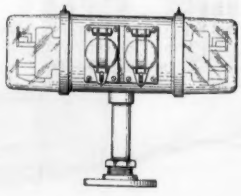


258,503
VEHICLE WHEEL
Thomas H. Semple, Romeo, Mich., assignor to General Motors Corporation, Detroit, Mich.
Filed Aug. 13, 1979, Ser. No. 66,065
Term of patent 7 years
Int. Cl. D12—*16*
U.S. Cl. D12—211

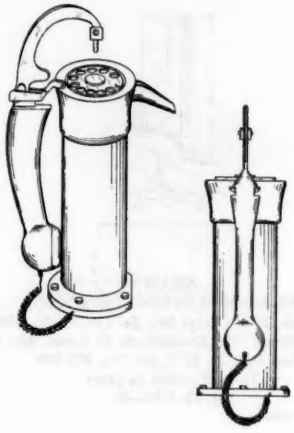
258,504
VEHICLE WHEEL
John R. Schinella, Bloomfield Hills, Mich., assignor to General Motors Corporation, Detroit, Mich.
Filed Sep. 24, 1979, Ser. No. 78,669
Term of patent 7 years
Int. Cl. D12—*16*
U.S. Cl. D12—211



258,505
COMBINED METER AND ELECTRICAL HOUSING
Robert N. Fenton, 175 Cross St., City Island, N.Y. 10464
Filed Dec. 28, 1978, Ser. No. 974,125
Term of patent 14 years
Int. Cl. D13—*03*; D10—*04*
U.S. Cl. D13—40

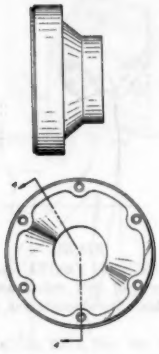


258,506
TELEPHONE
Wesley L. Thomas, 109 S. Catalina St., Los Angeles, Calif. 90004
Filed Feb. 12, 1979, Ser. No. 11,369
Term of patent 14 years
Int. Cl. D14—*03*; D21—*01*
U.S. Cl. D14—53

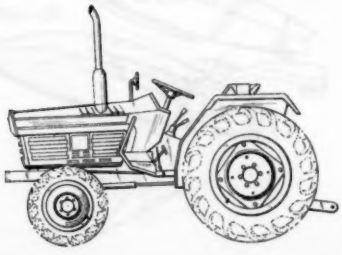


258,507
TELEPHONE ANSWERING DEVICE-ADAPTER
Gerhard Dietrich, Nuremberg, Fed. Rep. of Germany, assignor to Grundig Aktiengesellschaft, Furth, Fed. Rep. of Germany
Filed Aug. 31, 1978, Ser. No. 938,531
Claims priority, application Fed. Rep. of Germany, May 23, 1978, 6295
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—66

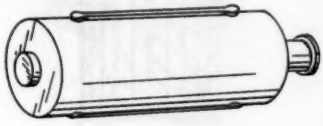
258,508
PUMP IMPELLER HOUSING
Victor M. Serrambana, 160 Hurlburt St., Glastonbury, Conn. 06033
Filed Apr. 13, 1978, Ser. No. 895,879
Term of patent 14 years
Int. Cl. D15—*02*
U.S. Cl. D15—1



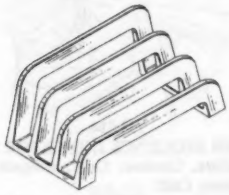
258,509
TRACTOR
Genichi Funabashi, Sennan, Japan, assignor to Kubota, Ltd., Japan
Filed Jul. 24, 1978, Ser. No. 927,678
Claims priority, application Japan, Jan. 25, 1978, 53-2312
Term of patent 14 years
Int. Cl. D15—*03*
U.S. Cl. D15—23



258,510
TRANSPORT ROLLER FOR LABEL PRINTER OR THE LIKE
Harry L. Berzack, 17 Mervyn Rd., Glenhazel, Johannesburg, South Africa (2192)
Filed Sep. 25, 1978, Ser. No. 945,778
Claims priority, application South Africa, Apr. 7, 1978, 78/0647
Term of patent 14 years
Int. Cl. D18—*99*
U.S. Cl. D18—22

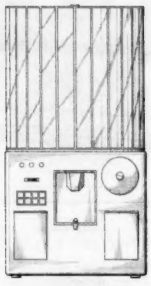


258,511
CARD RACK OR THE LIKE
Harold P. Ashton, Providence, R.I., assignor to Dart Industries Inc., Los Angeles, Calif.
Filed Apr. 16, 1979, Ser. No. 30,582
Term of patent 14 years
Int. Cl. D19—*02*
U.S. Cl. D19—90

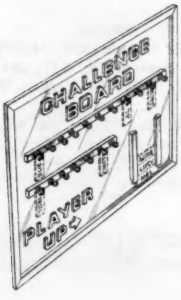


258,512
DESK SUPPORT FOR A DOCUMENT HOLDER
Jerome M. O'Toole, Spartanburg, S.C., and Edmund T. Paquette, Shrewsbury, Mass., assignors to Wright Line Inc., Worcester, Mass.
Filed Sep. 12, 1977, Ser. No. 832,684
Term of patent 7 years
Int. Cl. D19—*99*
U.S. Cl. D19—100

258,513
BULK HEALTH FOOD VENDING DISPENSER
Dennis H. Brazil, P.O. Box 80, Central Valley, Calif. 96019, and John J. Sears, P.O. Box 629, Project City, Calif. 96079
Filed Dec. 27, 1978, Ser. No. 974,137
Term of patent 14 years
Int. Cl. D20—*01*
U.S. Cl. D20—4

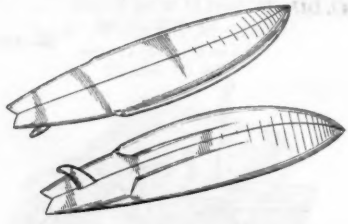


258,514
PLAYER SEQUENCE INDICATOR SIGN
Armando E. Acosta, Gardena, Calif., assignor to George S. Bernyk, Torrance, Calif.
Filed Jul. 24, 1978, Ser. No. 927,676
Term of patent 14 years
Int. Cl. D20—*03*
U.S. Cl. D20—42

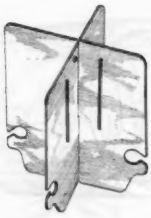


258,515
DOLL
Rebecca Rutt, 2032 Kessler Blvd., East Dr., Indianapolis, Ind. 46220
Filed Dec. 28, 1978, Ser. No. 974,204
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—166

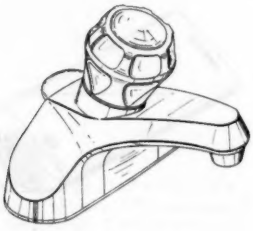
258,516
SWALLOW TAIL SURFBOARD
Michael R. Slingerland, 240 Florita St., Encinitas, Calif. 92024
Filed Aug. 24, 1977, Ser. No. 827,152
Term of patent 7 years
Int. Cl. D21—*02*
U.S. Cl. D21—236



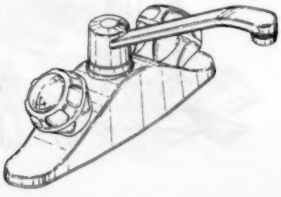
258,517
INSECT TRAP CROSS-MEMBER SUPPORT
James W. Seidenberger, Royersford, Pa., assignor to Richardson-Merrell Inc., Wilton, Conn.
Filed Mar. 5, 1979, Ser. No. 17,185
Term of patent 14 years
Int. Cl. D22—*06*
U.S. Cl. D22—19



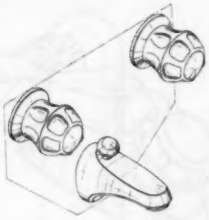
258,518
LAVATORY FAUCET
Gilles Thévenot, Baden-Baden, Fed. Rep. of Germany, assignor to Friedrich Grohe Armaturenfabrik GmbH & Co., Fed. Rep. of Germany
Filed Jul. 23, 1979, Ser. No. 59,509
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—23



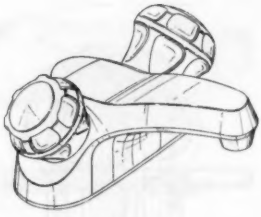
258,519
KITCHEN SINK FAUCET
Gilles Thévenot, Baden-Baden, Fed. Rep. of Germany, assignor to Friedrich Grohe Armaturenfabrik GmbH & Co., Fed. Rep. of Germany
Filed Jul. 23, 1979, Ser. No. 59,503
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—25



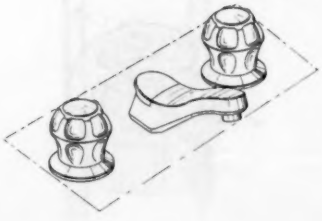
258,520
COMBINED BATH AND SHOWER FIXTURE UNIT
Gilles Thévenot, Baden-Baden, Fed. Rep. of Germany, assignor to Friedrich Grohe Armaturenfabrik GmbH & Co.
Filed Jul. 23, 1979, Ser. No. 59,505
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—26



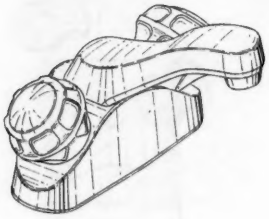
258,521
LAVATORY FAUCET
Gilles Thévenot, Baden-Baden, Fed. Rep. of Germany, assignor to Friedrich Grohe Armaturenfabrik GmbH & Co., Fed. Rep. of Germany
Filed Jul. 23, 1979, Ser. No. 59,508
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—25



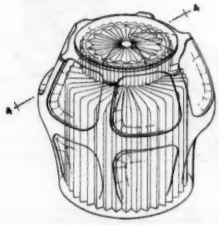
258,522
LAVATORY FIXTURE UNIT
Gilles Thévenot, Baden-Baden, Fed. Rep. of Germany, assignor to Friedrich Grohe Armaturenfabrik GmbH & Co., Fed. Rep. of Germany
Filed Jul. 23, 1979, Ser. No. 59,506
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—25



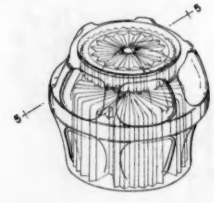
258,523
LAVATORY FAUCET
Gilles Thévenot, Baden-Baden, Fed. Rep. of Germany, assignor to Friedrich Grohe Armaturenfabrik GmbH & Co., Fed. Rep. of Germany
Filed Jul. 23, 1979, Ser. No. 59,507
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—25



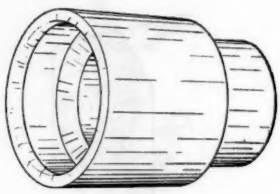
258,524
FAUCET HANDLE OR THE LIKE
Gilles Thévenot, Baden-Baden, Fed. Rep. of Germany, assignor to Friedrich Grohe Armaturenfabrik GmbH & Co., Fed. Rep. of Germany
Filed Jul. 23, 1979, Ser. No. 59,511
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—28



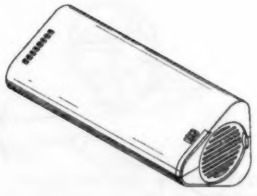
258,525
FAUCET HANDLE OR THE LIKE
Gilles Thévenot, Baden-Baden, Fed. Rep. of Germany, assignor to Friedrich Grohe Armaturenfabrik GmbH & Co., Fed. Rep. of Germany
Filed Jul. 24, 1979, Ser. No. 60,141
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—28



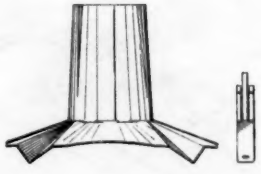
258,526
CONNECTION FITTING FOR TUBULAR CONDUITS
Bill P. P. Nederman, Halalid 3, S-252 33 Helsingborg, Sweden
Division of Ser. No. 786,681, Apr. 11, 1977. This application Jun. 14, 1979, Ser. No. 48,601
Claims priority, application Sweden, Oct. 21, 1976, 762040
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—43



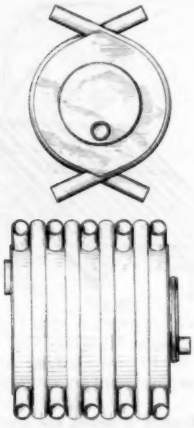
258,527
COMBINED TOWEL WARMER AND FABRIC DRYER
Mary Souhan, 5543 Emerson St., Dallas, Tex. 75209, and Raymond M. Green, Jr., Richardson, Tex., assignors to Mary Souhan, Dallas, Tex.
Filed Sep. 26, 1978, Ser. No. 945,955
Term of patent 14 years
Int. Cl. D23—*03*
U.S. Cl. D23—77



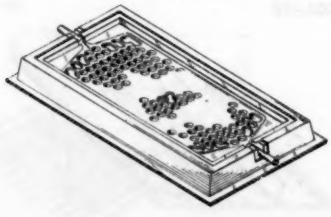
258,528
COMBINED CHARCOAL IGNITER AND HANDLE THEREFOR
Theodore Noose, 4401 W. Verdugo, Burbank, Calif. 91505
Filed Sep. 28, 1978, Ser. No. 946,663
Term of patent 14 years
Int. Cl. D23—*03*
U.S. Cl. D23—90.1



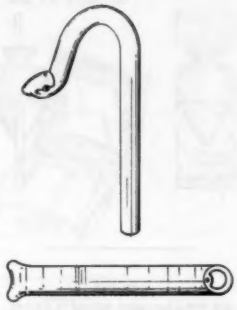
258,529
HEATING STOVE
Eric Darnell, Star Route, South Strafford, Vt. 05070
Filed Feb. 21, 1978, Ser. No. 879,692
Term of patent 14 years
Int. Cl. D23—*03*
U.S. Cl. D23—97



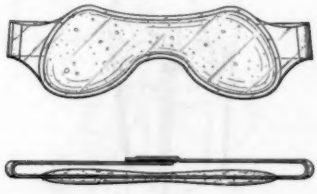
258,530
FLAT PLATE SOLAR COLLECTOR
Donald A. Atkinson, 297 Genesee St., Chittenango, N.Y. 13037
Filed Apr. 23, 1979, Ser. No. 32,142
Term of patent 14 years
Int. Cl. D23—*03*
U.S. Cl. D23—72



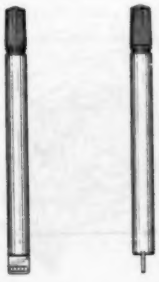
258,531
SALIVA EJECTOR
John H. Orsing, Helsingborg, Sweden, assignor to Orsing Incorporated, San Francisco, Calif.
Filed Jul. 21, 1978, Ser. No. 926,882
Claims priority, application Sweden, Jan. 25, 1978, 780201
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D24—10



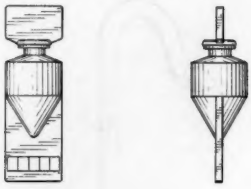
258,532
THERAPEUTIC COSMETIC COMPRESS
Kurt J. Wagner, 14050 Valley Vista, Sherman Oaks, Calif.
Filed Aug. 14, 1978, Ser. No. 933,256
Term of patent 14 years
Int. Cl. D24—*02*; D2—*03*
U.S. Cl. D24—49



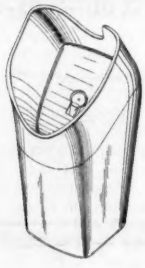
258,533
CULTURE VIAL OR THE LIKE
Louis T. Pagels, Hanover Park, Ill., assignor to Automatic Liquid Packaging, Inc., Ill.
Filed Jun. 23, 1978, Ser. No. 918,433
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D24—56



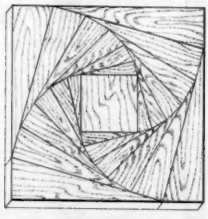
258,534
TAPERED VIAL OR THE LIKE
Dieter H. Nagel, Des Plaines, Ill., assignor to Automatic Liquid Packaging, Inc., Ill.
Filed Sep. 15, 1978, Ser. No. 942,900
Term of patent 14 years
Int. Cl. D24—*99*
U.S. Cl. D24—56



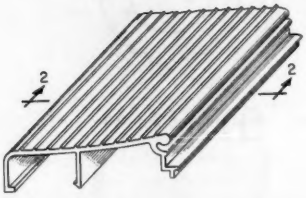
258,535
ULTRASONIC NEBULIZER
Ernst Reichl, Munich, Fed. Rep. of Germany, assignor to Bosch Siemens Hausgerate GmbH, Munich, Fed. Rep. of Germany
Filed Jul. 7, 1978, Ser. No. 922,781
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D24—62



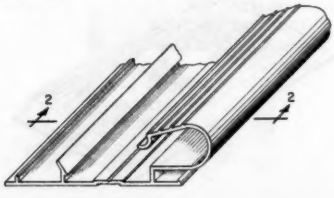
258,536
WOODEN PANEL FOR TILES, BUILDING PANELS, FURNITURE AND THE LIKE
David Kay, Raleigh, N.C.
Filed May 18, 1978, Ser. No. 907,260
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D25—92



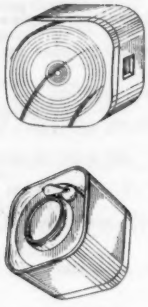
258,537
SWIMMING POOL COPING MEMBER OR SIMILAR ARTICLE
James T. Cribben, Mechanicsburg, and Richard A. Feeser, Mt. Holly Springs, both of Pa., assignors to Capitol Products Corporation, Mechanicsburg, Pa.
Filed Apr. 30, 1979, Ser. No. 34,864
Term of patent 14 years
Int. Cl. D25—*99*
U.S. Cl. D25—74



258,538
SWIMMING POOL COPING MEMBER OR SIMILAR ARTICLE
James T. Cribben, Mechanicsburg, and Richard A. Feeser, Mt. Holly Springs, both of Pa., assignors to Capitol Products Corporation, Mechanicsburg, Pa.
Filed Apr. 30, 1979, Ser. No. 34,865
Term of patent 14 years
Int. Cl. D25—*99*
U.S. Cl. D25—74

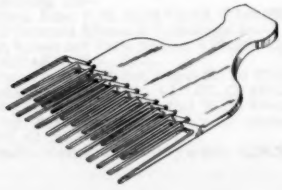


258,539
INSPECTION LAMP FOR AUTOMOBILES
Chung S. Leung, Kowloon, Hong Kong, assignor to Foster Industries Co., Ltd., Kowloon, Hong Kong
Filed Nov. 6, 1978, Ser. No. 957,871
Claims priority, application United Kingdom, May 9, 1978, 984510
Term of patent 14 years
Int. Cl. D26—*02*
U.S. Cl. D26—46



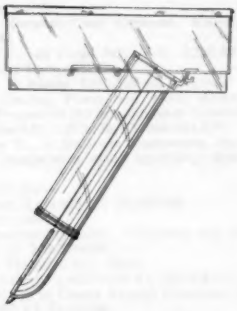
258,540
CIGARETTE TREATMENT DEVICE AND SIMILAR ARTICLE
Paul M. Kotuby, Naugatuck, and Joseph F. Reed, Bridgewater, both of Conn., assignors to Risdon Corporation, Naugatuck, Conn.
Filed Dec. 4, 1978, Ser. No. 966,104
Term of patent 14 years
Int. Cl. D27—*99*
U.S. Cl. D27—51

258,541
DOUBLE HAIR PICK
Ivy Featherstone, 3024 Hudson St., Columbus, Ohio 43219
Filed Jul. 28, 1978, Ser. No. 928,913
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D28—31

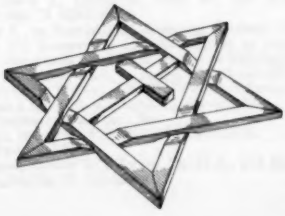


258,542
COSMETIC BOX
Alain Chevassus, Sceaux, France, assignor to Lefebure Isolants Reunis, Rungis, France
Filed Oct. 23, 1978, Ser. No. 953,779
Claims priority, application France, Apr. 24, 1978, 78 41309
The portion of the term of this patent subsequent to Jul. 29, 1994, has been disclaimed.
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D28—83

258,543
SMALL ANIMAL HABITAT MODULE OR SIMILAR ARTICLE
John A. Molnar, Metuchen, N.J., assignor to Metaframe Corporation
Filed Jan. 13, 1978, Ser. No. 869,157
Term of patent 14 years
Int. Cl. D30—*02*
U.S. Cl. D30—1



258,544
STAR EMBLEM
Amedeo P. Benedetto, R.F.D. 2, Exeter, N.H. 03833
Filed Dec. 27, 1977, Ser. No. 864,930
Term of patent 14 years
Int. Cl. D31—*00*
U.S. Cl. D99—27



LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 10TH DAY OF MARCH, 1981

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A. B. Chance Company: *See*—
Bosch, Mahlon L.; and Kehl, Jason S., 4,255,608, Cl. 174-5.00R.

A.E.S. Wordplex Limited: *See*—
Kelly, Hugh-Peter G., 4,255,064, Cl. 400-708.000.

A. E. Staley Manufacturing Company: *See*—
Stevens, Frank H., 4,255,484, Cl. 428-286.000.

A. F. Industries, Inc.: *See*—
Fieser, Arthur H.; and Anderson, Charles H., Jr., 4,254,942, Cl. 266-51.000.

A/S Orthana Kemisk Fabrik: *See*—
Pedersen, Ernst L.; and Balslev, Erik, 4,254,535, Cl. 17-45.000.

AB Akerlund & Rausing: *See*—
Jeppsson, Jan-Bertil, 4,254,891, Cl. 270-359.000.

AB Asea-Atom: *See*—
Borrman, Bo, 4,254,982, Cl. 294-81.00R.

Abbott Laboratories: *See*—
Raden, Daniel S.; Maripuri, Chala V.; and Becker, Frank C., 4,255,528, Cl. 521-129.000.
Stroupe, Stephen D.; and Moore, Edwin G., 4,255,385, Cl. 422-61.000.

Abdul-Malek, Adel B.: *See*—
Pappas, Peter G.; and Abdul-Malek, Adel B., 4,255,160, Cl. 44-70.000.

Abe, Naoto: *See*—
Shibue, Toshiaki; Nagayasu, Koichi; Mayama, Masayoshi; Ishihara, Masao; and Abe, Naoto, 4,255,515, Cl. 430-495.000.

Abraham, Edward D.; and Riha, Robert F., to IMC-Carver Foundry Products, Inc. Mold handler. 4,254,984, Cl. 294-88.000.

Acher, Jacques: *See*—
Thominet, Michel; Bulteau, Gerard; Acher, Jacques; and Colligon, Claude, 4,255,580, Cl. 546-197.000.

Ackley, Charles E., Jr.: *See*—
Ackley, Charles E., Sr.; and Ackley, Charles E., Jr., 4,254,704, Cl. 101-37.000.

Ackley, Charles E., Sr.; and Ackley, Charles E., Jr., to R. W. Hartnett Company. Conveyor bar with pocket insert for capsule printing mechanisms. 4,254,704, Cl. 101-37.000.

Acla, Howard L.: *See*—
Martin, Brice E.; Ritsko, Joseph E.; and Acla, Howard L., 4,255,397, Cl. 423-61.000.

Adachi, Keiichi: *See*—
Hirano, Shigeo; Adachi, Keiichi; and Tsujino, Nobuyuki, 4,255,511, Cl. 430-217.000.

Adachi, Takaaki: *See*—
Matsuda, Hideo; Yuki, Kiyohiro; Kawade, Takashi; Adachi, Takaaki; and Hanabe, Kenichi, 4,255,766, Cl. 358-257.000.

Adams, Charles L., to PVI Industries Inc. Modular heat exchanger. 4,254,826, Cl. 165-143.000.

Adams, Leo G.; and Hoffman, Richard E., to United States of America, Navy. Resin system for filament winding of pressure vessels. 4,255,302, Cl. 260-18.0EP.

Adams, Washington; and Miller, Kenneth J., to Rockwell International Corporation. Means for coupling a fiber optic cable with an electro-optic transducer. 4,255,015, Cl. 350-96.200.

Adhikary, Parimal K. Imidazoindole derivatives and pharmaceutical compositions comprising imidazoindole derivatives. 4,255,573, Cl. 544-247.000.

Adler, Roy L., to International Business Machines Corporation. Key controlled block cipher cryptographic system. 4,255,811, Cl. 375-2.000.

Adolf, Hermann; and Grupp, Bernhard, to Schubert & Salzer. Apparatus for controlling the bobbin drive of a flyer roving frame. 4,254,615, Cl. 57-96.000.

Adomeit, Heinz-Dieter, to Repa Feinstanzwerk GmbH. Winding shaft for a belt roll-up device for winding and unwinding a vehicle safety belt. 4,254,921, Cl. 242-107.40C.

Advanced Drainage Systems, Inc.: *See*—
Martin, Larry L., 4,255,107, Cl. 425-163.000.

Aerne, Fred. Oil burner combustion process. 4,255,114, Cl. 431-2.000.

AGA Aktiebolag: *See*—
Westberg, Johan E. H., 4,254,789, Cl. 137-88.000.

Agency of Industrial Science & Technology: *See*—
Tanie, Kazuo; and Tachi, Susumu, 4,254,776, Cl. 128-421.000.

AGFA-GEVAERT N.V.: *See*—
Laridon, Urbain L.; Marien, August M.; De Winter, Walter F.; and Kokelenberg, Hendrik E., 4,255,513, Cl. 430-281.000.

Aikens, William R.; and Kurz, Arthur W., to Standard Mirror Company, Inc. Rear view mirror mount for interior of automobile. 4,254,931, Cl. 248-549.000.

Aimett, Paolo. Vertical strip furriery article. 4,254,507, Cl. 2-65.000.

Aisan Industry Co., Ltd.: *See*—
Takada, Shigetaka; Okamura, Masayuki; Naruse, Kazumichi; and Watanabe, Yukihiro, 4,254,754, Cl. 123-437.000.

Aisin Seiki Kabushiki Kaisha: *See*—
Inada, Masami; Kitamura, Kazuhiko; Ito, Shoji; Nonoyama, Takao; and Tsuji, Riichi, 4,254,938, Cl. 251-367.000.
Mizuno, Kiyofumi; Sato, Masanori; Maeda, Hiroaki; Takahashi, Shigeo; and Suzuki, Satomi, 4,254,672, Cl. 74-869.000.

Akagawa, Masatake: *See*—
Miyata, Seiji; Akagawa, Masatake; Yamamoto, Masahiro; and Inoue, Noboru, 4,254,779, Cl. 128-731.000.

Akashi, Shunji: *See*—
Yoshida, Hiroshi; and Akashi, Shunji, 4,254,539, Cl. 24-205.11F.

Akio, Ohno; and Yuichi, Tamura, to Fuji Koki Manufacturing Oc., Ltd. Control valve to be employed for refrigerator and air conditioner. 4,254,634, Cl. 62-217.000.

Akita, Hiroko: *See*—
Terada, Osamu; Uwajima, Takayuki; and Akita, Hiroko, 4,255,519, Cl. 435-190.000.

Akko, Inc.: *See*—
Frishman, Daniel, 4,255,001, Cl. 312-114.000.

Aktiebolaget Hassle: *See*—
Junggren, Ulf K.; and Sjostrand, Sven E., 4,255,431, Cl. 424-263.000.

Aktiebolaget SKF: *See*—
Olschewski, Armin; Walter, Lothar; Brandenstein, Manfred; Kunkel, Heinrich; and Norlander, Gosta, 4,255,000, Cl. 308-8.200.

Aktiebolaget Somas Ventiler: *See*—
Hubertson, Folke H., 4,254,937, Cl. 251-305.000.

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Akzo N.V.: *See*—
Kock, Manfred, 4,255,346, Cl. 260-4124.000.
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Akzona Incorporated: *See*—
Emmerich, Hermann; and Ottmann, Rudolf, 4,255,109, Cl. 425-227.000.
Franks, Neal E.; and Varga, Julianna K., 4,255,300, Cl. 260-17.4CL.

Aladdin Equipment Company: *See*—
Combest, H. E. Buddy, 4,254,525, Cl. 15-1.700.

Albert, Alban; Courbat, Pierre; and Weith, Andre, to Ciba-Geigy Corporation. Process for the preparation of O-substituted derivatives of (+)-cyanidan-3-01. 4,255,336, Cl. 260-345.200.

Albert, Anthony H., to Beckman Instruments, Inc. T_3 Uptake test employing a precipitated nylon separating agent. 4,255,412, Cl. 424-1.000.

Albert Obrist AG: *See*—
Obrist, Albert, 4,254,603, Cl. 53-490.000.

Albrecht, Erhard: *See*—
Greiner, Gunther; Gr/bein, Wolfgang; and Albrecht, Erhard, 4,255,257, Cl. 210-709.000.

Alco Electronic Products, Inc.: *See*—
Contarino, Alfred F., 4,255,638, Cl. 200-302.000.

Alexander, Frank N., to Cessna Aircraft Company, The. Flow control valve. 4,254,687, Cl. 91-29.000.

Aliev, Sakhib M. O.: *See*—
Aliev, Vagab S.; Aliev, Sakhib M. O.; Gadzhiev, Farrukh R. O.; Guseinov, Novruz I. O.; Mamedov, Shamkhal A. M. O.; Mardanov, Medzhid A.; Sverdlov, Rafail S.; and Khydyrov, Dzhavid N. O., 4,255,350, Cl. 260-453.00P.

Aliev, Vagab S.; Aliev, Sakhib M. O.; Gadzhiev, Farrukh R. O.; Guseinov, Novruz I. O.; Mamedov, Shamkhal A. M. O.; Mardanov, Medzhid A.; Sverdlov, Rafail S.; and Khydyrov, Dzhavid N. O. Process for preparing methyl isocyanate. 4,255,350, Cl. 260-453.00P.

Allegheny Ludlum Steel Corporation: *See*—
Reen, Orville W.; and Osborn, Merlin L., 4,255,494, Cl. 428-551.000.

Allen & Hanburys Limited: *See*—
Price, Barry J.; Clitherow, John W.; and Bradshaw, John, 4,255,440, Cl. 424-274.000.

Allen, John K., to Standard Oil Company (Indiana). Combination of pyrolysis and incineration of solid mixture of oxygen-containing aromatic compounds obtained as residue of manufacture of benzene di- and tricarboxylic acids. 4,255,590, Cl. 562-416.000.

Allen, Ralph G., to McNair, John E. Rifle scope having compensation for elevation and drift. 4,255,013, Cl. 350-10.000.

Allergan Pharmaceuticals, Inc.: *See*—
Leopold, Irving H., 4,255,419, Cl. 424-145.000.

Allerton, David A.: *See*—
Postupack, Dennis S.; Allerton, David A.; and Emmert, Richard L., 4,254,734, Cl. 118-624.000.

Postupack, Dennis S.; and Allerton, David A., 4,254,735, Cl. 118-700.000.
Allied Chemical Corporation: *See—*
Baughman, Ray H.; Turi, Edith A.; Preziosi, Anthony F.; and Yee, Kwok-Chun, 4,255,535, Cl. 525-129.000.
Dellavecchia, Michael P., 4,255,219, Cl. 156-243.000.
Novotny, Miroslav, 4,255,594, Cl. 568-842.000.
Ray, Ranjan, 4,255,189, Cl. 75-123.00B.
Segal, Leon; and DeBona, Bruce T., 4,255,556, Cl. 528-190.000.
Allied Surveyor Supplies Manufacturing Co.: *See—*
Feldman, Gilbert J.; and Feldman, Richard A., 4,254,597, Cl. 52-103.000.
Alpkvist, Jan A.; Tornkvist, Rolf G. A.; and Wurzig, Lars R., to Forenade Fabriksverken. Apparatus for combusting liquid, gaseous or powdered fuels. 4,255,122, Cl. 431-215.000.
Altherr, Eric; Hafer, Ronald L.; and Pepin, Richard L., to Sandoz, Inc. Disperse dyeing of triacetate. 4,255,153, Cl. 8-582.000.
Amax Inc.: *See—*
Bond, Armand P.; Bryhan, Anthony J.; and Redmond, James D., 4,255,497, Cl. 428-685.000.
Redmond, James D., 4,255,213, Cl. 148-6.110.
American Air Filter Company, Inc.: *See—*
Wilkins, O. DuWayne, 4,255,175, Cl. 55-357.000.
American Biltrite, Inc.: *See—*
Guyer, Nathan E., 4,255,137, Cl. 432-225.000.
American Cyanamid Company: *See—*
Arendt, Volker D., 4,255,547, Cl. 526-291.000.
Daftary, Shashikumar H., 4,255,532, Cl. 525-59.000.
Granzow, Albrecht H.; and Savides, Christos, 4,255,324, Cl. 260-45.85T.
Tucker, Robert J., 4,255,304, Cl. 260-23.00H.
American Home Products Corporation: *See—*
Scotese, Anthony C.; Morris, Robert L.; and Santilli, Arthur A., 4,255,568, Cl. 544-91.000.
American Hospital Supply Corporation: *See—*
Huempfner, David F.; Rippe, Douglas A.; and Martin, Robert E., 4,254,928, Cl. 248-422.000.
Vidal, Claude A., 4,254,771, Cl. 128-275.000.
American National Red Cross: *See—*
Schwartz, P. Christopher; and Spielberg, Richard I., 4,255,788, Cl. 364-416.000.
American Optical Corporation: *See—*
Naylor, Thomas K.; and Cavigelli, George A., 4,255,769, Cl. 360-65.000.
American Screen Printing Equipment Company: *See—*
Bubley, Henry J.; Krutsch, John R.; and Oltra, Claude H., 4,254,708, Cl. 101-123.000.
Lala, Louis A., 4,254,706, Cl. 101-38.00R.
American Standard Inc.: *See—*
Link, Charles T., 4,255,744, Cl. 340-399.000.
Amici, Francesco. Hydraulic syphon with pneumatic reflux. 4,254,934, Cl. 251-61.100.
AMP Incorporated: *See—*
Clark, Donald R., 4,255,009, Cl. 339-97.00P.
Kourimsky, Friedrich J. A.; and Nix, Lothar H. W., 4,255,004, Cl. 339-17.00E.
AMSTED Industries Incorporated: *See—*
Clafford, Arthur H., 4,254,713, Cl. 105-197.0DB.
O'Neil, Gerald D., 4,254,712, Cl. 105-197.0DB.
Schuricht, Henry A., 4,254,861, Cl. 198-774.000.
Amtel, Inc.: *See—*
Kentosh, James M., 4,254,523, Cl. 9-8.00P.
Anav, Lello. Portable drafting device for drawing parallel lines, comprising a working plane of flexible plastic material, adapted to be rolled. 4,254,556, Cl. 33-437.000.
Anchor Hocking Corporation: *See—*
Springer, Donald A., 4,254,824, Cl. 165-64.000.
Andersen Samplers Inc.: *See—*
Smith, Michael L., 4,255,172, Cl. 55-270.000.
Anderson, Charles H., Jr.: *See—*
Fieser, Arthur H.; and Anderson, Charles H., Jr., 4,254,942, Cl. 266-51.000.
Anderson, David M.; and Erb, John C., to Filper Corporation. Blade arrangement in a peach pitter. 4,254,701, Cl. 99-554.000.
Anderson, Gordon H.; Nelson, David R.; and Fetterly, Richard T., to King-Seeley Thermos Co. Time cycle control system for vibratory finishing machines. 4,254,586, Cl. 51-163.100.
Anderson, J. Hilbert, to Sea Solar Power. Deaerating system for sea thermal power plants. 4,254,626, Cl. 60-641.000.
Anderson, Robert J., to Beckman Instruments, Inc. Method of generating nitrogen for flameless emission spectroscopy. 4,255,052, Cl. 356-316.000.
Anderson, Thomas A. Trowel device. 4,254,980, Cl. 294-15.000.
Ando, Yujiro: *See—*
Ohara, Katsunobu; Tanaka, Keiji; Ando, Yujiro; and Moriyama, Inao, 4,255,507, Cl. 430-53.000.
Andre, Pierre A.; Thevenin, Jean-Claude P. H. P.; Girault, Jean-Pierre Y. B.; and Richter, Gerhard, to Societe Nationale D'Etude Et De Construction De Moteurs D'Aviation. Method and device for reducing the noise of turbo-machines. 4,255,083, Cl. 415-119.000.
Andrews, William W., to Research Cottrell, Inc. Electrostatic precipitator rapper control system with enhanced accuracy. 4,255,775, Cl. 361-153.000.
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Anetsberger, Richard J.; and Anetsberger, John A., 4,255,106, Cl. 425-152.000.
Anetsberger, John A.: *See—*
Anetsberger, Richard J.; and Anetsberger, John A., 4,255,106, Cl. 425-152.000.
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Anisimov, Jury V.: *See—*
Kalinin, Viktor P.; Avdjukhin, Sergei P.; Lebedev, Vsevolod I.; Zhilin, Viktor F.; Frolov, Vladimir S.; Anisimov, Jury V.; Slavin, Jury T.; and Larionov, Valentin N., 4,255,373, Cl. 264-65.000.
Aniskovich, Valery M.: *See—*
Zatsepin, Nikolai N.; Siljuk, Viktor F.; Malko, Ivan I.; Kaloshin, Valentin A.; Aniskovich, Valery M.; Naumenko, Nikolai N.; and Perfiliev, Vladimir V., 4,255,709, Cl. 324-229.000.
Anspon, Harry D., to United States Steel Corporation. Method of making a high impact polystyrene. 4,255,315, Cl. 260-33.6AQ.
Antonoplos, Patricia A.; and Heilman, William J., to Gulf Oil Corporation. Novel end-capped polyimide oligomers. 4,255,313, Cl. 260-30.200.
Antos, George J.: *See—*
Flagg, John F.; and Antos, George J., 4,255,290, Cl. 252-466.00B.
Aoki, Harumi, to Asahi Kogaku Kogyo Kabushiki Kaisha. Focus detecting device in camera. 4,255,028, Cl. 354-25.000.
Aoki, Masahiro: *See—*
Suzuki, Takeomi; Oinoue, Kenichi; Aoki, Masahiro; Kenjyo, Hideyuki; and Ida, Masatoshi, 4,255,654, Cl. 250-204.000.
Aoki, Toshio; Takayama, Atsumi; Matsuuchi, You; Baba, Mikito; and Kawazoe, Kenichiro, to Mitsumi Electric Co., Ltd. Push-button type tuning apparatus. 4,254,665, Cl. 74-10.330.
Aoyagi, Mitsuhiro. Cutting instrument for a root canal filler in dental treatment. 4.255,142, Cl. 433-72.000.
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Araki, Yoshihiko; Hara, Hajime; and Aoyama, Kazuho, 4,255,312, Cl. 260-29.70H.
Apollo Hair Systems, Inc.: *See—*
Nelson, Charles W., 4,254,784, Cl. 132-53.000.
Arai, Fuminori: *See—*
Kitajima, Masao; Arai, Fuminori; and Kondo, Asaji, 4,255,384, Cl. 422-57.000.
Arakawa, Hideo; Kuniya, Keiichi; and Ohashi, Masabumi, to Hitachi, Ltd. Method of fabricating electrode plate for supporting semiconductor device. 4,254,548, Cl. 29-879.000.
Araki, Tamio: *See—*
Ogawa, Masaki; and Araki, Tamio, 4,255,296, Cl. 260-5.000.
Araki, Yoshihiko; Hara, Hajime; and Aoyama, Kazuho, to Nippon Oil Co., Ltd. Aqueous pigment dispersion used for aqueous coating compositions. 4,255,312, Cl. 260-29.70H.
Arbit, Harold A., to Mobil Oil Corporation. Blends with poly(p-methylstyrene). 4,255,531, Cl. 525-237.000.
Arends, Albert W.; and Henke, Ronald E., to Leesona Corporation. Thermoforming machine with automatically mechanically operated web stripping element. 4,255,382, Cl. 264-544.000.
Arendt, Phillip S., to Peavey Company. Roasted ground wheat coating. 4,255,456, Cl. 426-64.000.
Arendt, Volker D., to American Cyanamid Company. Novel elastomer composition and processes therefor. 4,255,547, Cl. 526-291.000.
Argus Chemical Corporation: *See—*
Brecker, Lawrence R.; and Keeley, Charles, 4,255,320, Cl. 260-45.750.
Minagawa, Motonobu; Nakahara, Yutaka; and Kubota, Naohiro, 4,255,301, Cl. 260-18.0TN.
Arita, Isao; and Maede, Fumitaka, to Shinzo Kitamura. Yarn break detector in ring frames. 4,254,613, Cl. 57-81.000.
Armas, Russell G.; and McGowan, Patrick A. Combination lighter. 4,254,761, Cl. 126-451.000.
Armitage, John D., Jr.; Barkley, John A.; Hooker, Ross B., III; and Walker, James R., to International Business Machines Corporation. Light pipe for accurate erasure of photoconductor charge. 4,255,042, Cl. 355-3.00R.
Armstrong Cork Company: *See—*
Franze, John P., 4,255,217, Cl. 156-209.000.
Arnolds, Karlheinz E. H., to Baldwin-Gegenheimer Corporation. Ink roller cleaning device. 4,254,709, Cl. 101-425.000.
Arnoldsson, Erik; and Bjorklund, Lars-Ake, to Kockums Industri AB. Device for collecting and processing tree stumps. 4,254,874, Cl. 209-3.000.
Asahi Glass Company, Limited: *See—*
Oda, Yoshio; Otouma, Hiroshi; and Endoh, Eiji, 4,255,247, Cl. 204-293.000.
Ukihashi, Hiroshi; Asawa, Tatsuro; and Gunjima, Tomoki, 4,255,523, Cl. 521-27.000.
Asahi, Hirozi: *See—*
Suzuki, Yasoji; Ochii, Kiyofumi; and Asahi, Hirozi, 4,255,678, Cl. 307-355.000.
Asahi Kasei Kogyo Kabushiki Kaisha: *See—*
Miyake, Tetsuya; Inada, Kohji; and Asano, Motohisa, 4,255,607, Cl. 585-805.000.
Sakurai, Hisaya; Morita, Hideo; Miya, Masayoshi; Takaya, Katsuhiko; and Yoneda, Haruyuki, 4,255,280, Cl. 252-429.00B.
Asahi Kogaku Kogyo Kabushiki Kaisha: *See—*
Aoki, Harumi, 4,255,028, Cl. 354-25.000.
Asahi Medical Co., Ltd.: *See—*
Miyata, Seiji; Akagawa, Masatake; Yamamoto, Masahiro; and Inoue, Noboru, 4,254,779, Cl. 128-731.000.

Asahi, Satoshi: *See—*
Kimura, Akio; and Asahi, Satoshi, 4,255,544, Cl. 526-124.000.

Asano, Mitsugu: *See—*
Ishikawa, Masami; Okano, Hirochika; Katagiri, Shigenobu; Asano, Mitsugu; and Fujieda, Toshiaki, 4,254,705, Cl. 101-93.290.

Asano, Motohisa: *See—*
Miyake, Tetsuya; Inada, Kohji; and Asano, Motohisa, 4,255,607, Cl. 585-805.000.

Asawa, Tatsuro: *See—*
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Aschwanden, Felix, to RCA Corporation. Self-adjusting bell filter circuit for use in SECAM coders. 4,255,758, Cl. 358-14.000.

Asculai, Samuel S.: *See—*
Fields, Joseph E.; Asculai, Samuel S.; and Johnson, John H., 4,255,537, Cl. 525-328.000.

ASEA Aktiebolag: *See—*
Backskog, Hans, 4,255,632, Cl. 200-148.00R.

Ash, Stanley P., to International Telephone and Telegraph Corporation. Apparatus for making aluminum wheel covers. 4,254,650, Cl. 72-357.000.

Ashiwa, Jun: *See—*
Fukasawa, Atsushi; Ashiwa, Jun; and Sato, Takuro, 4,255,729, Cl. 333-202.000.

Askew, Herbert F.: *See—*
Harrington, Colin J.; and Askew, Herbert F., 4,255,586, Cl. 556-402.000.

Aspro, Inc.: *See—*
St. John, Richard C., 4,254,541, Cl. 29-445.000.

Asselman, George A. A.; Schroder, Johann; and Mahdjuri, Faramarz, to U.S. Philips Corporation. Heat transport device. 4,254,820, Cl. 165-39.000.

Ataka, Saburo: *See—*
Maruyama, Eiichi; Imamura, Yoshinori; Ataka, Saburo; Inao, Kiyohisa; Takasaki, Yukio; Tsukada, Toshihisa; and Hirai, Tadaaki, 4,255,686, Cl. 313-366.000.

Atlantic Richfield Company: *See—*
Frankovich, John H., 4,255,155, Cl. 44-1.0SR.
Sun, Jui-Yuan; Burk, Emmett H., Jr.; Yoo, Jin S.; and Masologites, George P., 4,255,156, Cl. 44-1.0SR.
Worrell, G. Richard, 4,254,819, Cl. 165-1.000.

Auclair, Michel; and Le Parmentier, Louis, to Exxon Research & Engineering Co. Mixing apparatus and the uses thereof. 4,255,125, Cl. 431-354.000.

Audran, Roger G. L.; and Pingaud, Bernard J., to Eastman Kodak Company. Magnetic recording crystals, process for producing same, and magnetic recording webs using same. 4,255,492, Cl. 428-694.000.

Automation Systems, Inc.: *See—*
Bartlett, Peter G., 4,255,748, Cl. 340-661.000.

Avdjukhin, Sergei P.: *See—*
Kalinin, Viktor P.; Avdjukhin, Sergei P.; Lebedev, Vsevolod I.; Zhilin, Viktor F.; Frolov, Vladimir S.; Anisimov, Jury V.; Slavin, Jury T.; and Larionov, Valentin N., 4,255,373, Cl. 264-65.000.

Avesta Jernverks Aktiebolag: *See—*
von Matern, Sten; and Fredriksson, Rune O. W., 4,254,944, Cl. 266-275.000.

Avtec Industries, Inc.: *See—*
Helwig, William F., Jr., 4,254,788, Cl. 134-57.00D.

Axen, Udo F., to Upjohn Company, The. 2-Decarboxy-2-aminomethyl-6-keto-PGE$_1$ compounds. 4,255,355, Cl. 564-305.000.

B. F. Goodrich Company, The: *See—*
Cohen, Louis; Haehn, James B.; and Witenhafer, Donald E., 4,255,470, Cl. 427-230.000.
Miller, James R., 4,255,307, Cl. 260-29.6PT.
Schollenberger, Charles S.; and Dinbergs, Kornelius, 4,255,552, Cl. 528-50.000.
Skillicorn, Douglas E., 4,255,538, Cl. 525-329.000.

Baba, Mikito: *See—*
Aoki, Toshio; Takayama, Atsumi; Matsuuchi, You; Baba, Mikito; and Kawazoe, Kenichiro, 4,254,665, Cl. 74-10.330.

Babb, Robert M.; and Guillory, Melvin J., Jr., to Ciba-Geigy Corporation. Process for purifying cyanogen chloride gas. 4,255,167, Cl. 55-71.000.

Babbitt, Albert B., to Premier Forging Press Automation, Inc. Loader. 4,255,075, Cl. 414-222.000.

Backskog, Hans, to ASEA Aktiebolag. Grounding switch for gas-insulated high voltage switchgear. 4,255,632, Cl. 200-148.00R.

Badische Corporation: *See—*
Sanders, John H., 4,255,487, Cl. 428-368.000.

Bahrmann, Heinrich: *See—*
Herrmann, Wolfgang; Satzinger, Gerhard; Herrmann, Manfred; Steinbrecher, Wolfgang; and Bahrmann, Heinrich, 4,255,433, Cl. 424-267.000.

Bailey, Florence H. Anti-acne lotion. 4,255,418, Cl. 424-145.000.

Baker, Edward D.: *See—*
Lang-Ree, Nils; Brown, John S.; and Baker, Edward D., 4,254,697, Cl. 99-387.000.

Balda-Werke Photgraphische Gerate und Kunstosoff GmbH & Co., KG: *See—*
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Arnolds, Karlheinz E. H., 4,254,709, Cl. 101-425.000.

Balfanz, Fredrick J., to C-R-O, Inc. Programmed welding machine with continuously monitored override control. 4,255,643, Cl. 219-124.340.

Balinsky, George J.; Pine, Lloyd A.; and Mertzweiller, Joseph K., to Exxon Research & Engineering Co. Process for the preparation of magnetic catalysts. 4,255,289, Cl. 252-466.00B.

Ballantine Laboratories, Inc.: *See—*
Soojian, Haig, 4,255,706, Cl. 324-132.000.

Balslev, Erik: *See—*
Pedersen, Ernst L.; and Balslev, Erik, 4,254,535, Cl. 17-45.000.

Banks, George W. Vortex heat reclaiming system. 4,254,758, Cl. 126-247.000.

Banucci, Eugene G.: *See—*
Boldebuck, Edith M.; and Banucci, Eugene G., 4,255,471, Cl. 427-385.500.

Baranowski, Frank, Jr. Static fluid-swirl mixing. 4,255,124, Cl. 431-353.000.

Barker, Michael D. Method of casting photographic representation having tonal and height contrasts and the article so cast. 4,254,544, Cl. 29-527.300.

Barkis, Edward; Crummer, Robert R.; and Joyner, James M., to Standard Oil Company (Indiana). Extrusion coating compositions for woven and non-woven polyolefin substrates and articles thereof. 4,255,323, Cl. 260-45.75N.

Barkley, John A.: *See—*
Armitage, John D., Jr.; Barkley, John A.; Hooker, Ross B., III; and Walker, James R., 4,255,042, Cl. 355-3.00R.

Barloy, Michel, to Rhone-Poulenc Industries. Apparatus for introducing and mixing a liquid in an essentially liquid medium. 4,255,391, Cl. 422-259.000.

Barmag Barmer Machinenfabrik Aktiengesellschaft: *See—*
Hertell, Siegfried, 4,255,098, Cl. 418-76.000.

Barmag Barmer Maschinenfabrik Aktiengesellschaft: *See—*
Schippers, Heinz; and Dammann, Peter, 4,255,134, Cl. 432-59.000.

Barnes, Larry A.; Daugherty, Daniel; Flynn, Michael D.; Robertson, Michael D.; and Welch, Kenneth R., to San Angelo Communications & Electronics, Inc. Apparatus for pulse train measurement. 4,255,623, Cl. 179-175.20A.

Barnetche, Eduardo. Automatic depth compensating device. 4,254,838, Cl. 175-228.000.

Barratt, Don C. Foldable disposable sharps container. 4,254,862, Cl. 206-63.300.

Barrie, Andrew; and Herd, Quentin C., to Kratos Limited. Apparatus for charged particle spectroscopy. 4,255,656, Cl. 250-305.000.

Barron, Arthur D.: *See—*
Bartlett, Ian G.; Barron, Arthur D.; Lymer, Donald A.; and McKendrick, George A. R., 4,254,644, Cl. 68-205.00R.

Bartek, Joseph P.; and Grasselli, Robert K., to Standard Oil Company, The. Oxydehydrogenation process for alkylaromatics and catalyst therefor. 4,255,283, Cl. 252-437.000.

Bartlett, Ian G.; Barron, Arthur D.; Lymer, Donald A.; and McKendrick, George A. R., to Tybar Engineering Pty. Ltd. Application of liquid in multiple streams to a moving strip. 4,254,644, Cl. 68-205.00R.

Bartlett, Peter G., to Automation Systems, Inc. Bus fault detector. 4,255,748, Cl. 340-661.000.

Bartz, Kenneth W., to Exxon Research & Engineering Co. Copper adhesive composition. 4,255,533, Cl. 525-71.000.

BASF Aktiengesellschaft: *See—*
Engelbach, Heinz; Hoffmann, Harry; Palm, Peter; Sommer, Karl; and Sprague, Michael J., 4,255,285, Cl. 252-443.000.
Kranz, Joachim; and Sappok, Reinhard, 4,255,203, Cl. 106-288.00Q.
Opgenorth, Hans-Joachim; Scheuermann, Horst; Laas, Harald; and Nissen, Axel, 4,255,333, Cl. 260-319.100.
Oppenlaender, Knut; Strickler, Rainer; Geelhaar, Hans J.; Lamprecht, Josef; Penzel, Erich; and Ley, Gregor, 4,255,310, Cl. 260-29.60T.
Plath, Peter; Rohr, Wolfgang; and Goetz, Norbert, 4,255,587, Cl. 560-43.000.
Schoettle, Klaus; Muenzner, Wulf; Lechner, Hilmar; Woeppel, Dieter; and Gliniorz, Lothar, 4,254,585, Cl. 51-5.00A.

Basso, Robert J. Circular mail singulator. 4,254,859, Cl. 198-443.000.

Bateman, Earle W., III. Arrowhead and method of making. 4,254,958, Cl. 273-421.000.

Bau, Marcel. Scoop device. 4,254,979, Cl. 294-1.0BA.

Baughman, Ray H.; Turi, Edith A.; Preziosi, Anthony F.; and Yee, Kwok-Chun, to Allied Chemical Corporation. Organic polymers with near-zero uniaxial thermal expansion coefficients. 4,255,535, Cl. 525-129.000.

Baumann, Rene, to Wiba AG. Body exercise apparatus. 4,254,950, Cl. 272-130.000.

Baumler, Jurgen; and Schroter, Gerhard, to Heraeus Christ GmbH. Centrifuge rotor construction. 4,254,905, Cl. 233-26.000.

Baxter, Andrew J. G.: *See—*
Ponsford, Roger J.; Baxter, Andrew J. G.; and Southgate, Robert, 4,255,441, Cl. 424-274.000.

Baxter Travenol Laboratories, Inc.: *See—*
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Bayer Aktiengesellschaft: *See—*
Grogler, Gerhard; and Meyborg, Holger, 4,255,570, Cl. 544-197.000.
Harms, Wolfgang; Wunderlich, Klaus; and van Oertzen, Klaus, 4,255,325, Cl. 260-146.00T.
Hederich, Volker; Gehrke, Gunter; Kuth, Robert; and Kuhnel, Werner, 4,255,151, Cl. 8-532.000.
Hoffmann, Erwin; Dietrich, Werner; and Kraft, Karl J., 4,255,105, Cl. 425-144.000.
Hohlein, Peter; and Schoeps, Jochen, 4,255,530, Cl. 525-6.000.

Knops, Hans-Joachim; Brandes, Wilhelm; and Paul, Volker, 4,255,437, Cl. 424-270.000.
Kramer, Wolfgang; Buchel, Karl; Frohberger, Paul-Ernst; Brandes, Wilhelm; and Scheinpflug, Hans, 4,255,434, Cl. 424-269.000.
Meyer, Rolf-Volker; Dhein, Rolf; Fahnler, Friedrich; Michael, Dietrich; Rudolph, Hans; and Nielinger, Werner, 4,255,560, Cl. 528-339.000.
Mohring, Edgar; Muller, Hanns P.; and Wagner, Kuno, 4,255,529, Cl. 521-158.000.
Muller, Hans-Jurgen; Hombach, Rudolf; Dollhausen, Manfred; and Zirner, Joachim, 4,255,569, Cl. 544-193.000.
Suling, Carlhans; Korte, Siegfried; and Neukam, Theo, 4,255,546, Cl. 526-206.000.

Baylor College of Medicine: *See—*
Kuether, Christian L.; Williams, Robert E.; Decker, Thomas A.; Kurtzman, Charles; Richardson, Kenneth T.; and Harrison, Richard A., 4,255,022, Cl. 351-24.000.

Bayshore Creative Products, Inc.: *See—*
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BBC Brown Boveri & Company Limited: *See—*
Buhler, Karl, 4,255,126, Cl. 432-1.000.
Eisele, Dieter; Pape, Jurgen; and Hochhut, Armin, 4,254,590, Cl. 51-324.000.
Gruber, Helmut; and Reinhard, Kurt, 4,254,627, Cl. 60-646.000.
Krisch, Ernst; Meister, Jorg; and Moser, Josef, 4,255,683, Cl. 310-214.000.

Beattie, Thomas R.; Hannah, John; and Johnston, David B. R., to Merck & Co., Inc. Cephalosporin compounds. 4,255,423, Cl. 424-246.000.

Beatty, Theodore R., to Union Carbide Corporation. High pressure safety vent for galvanic dry cells. 4,255,499, Cl. 429-54.000.

Becker, Frank C.: *See—*
Raden, Daniel S.; Maripuri, Chala V.; and Becker, Frank C., 4,255,528, Cl. 521-129.000.

Beckman Instruments, Inc.: *See—*
Albert, Anthony H., 4,255,412, Cl. 424-1.000.
Anderson, Robert J., 4,255,052, Cl. 356-316.000.
Matsuyama, George; and Lindell, Grover F., 4,255,244, Cl. 204-195.00F.

Beckstein, Hellmut; and Schellenberger, Guenter, to Mahlo GmbH & Co. KG. Apparatus for measuring the position of weft threads in a moving fabric web. 4,255,050, Cl. 356-238.000.

Beecham Group Limited: *See—*
Davies, Richard V., 4,255,332, Cl. 260-245.300.
Ponsford, Roger J.; Baxter, Andrew J. G.; and Southgate, Robert, 4,255,441, Cl. 424-274.000.

Beery, Jack, to Burroughs Corporation. Control circuitry for actuation of a ribbonless endorser for printing variable information onto moving documents. 4,255,061, Cl. 400-124.000.

Beger, Robert W.: *See—*
Hensler, Paul L.; Church, Delmar F.; and Beger, Robert W., 4,255,274, Cl. 252-135.000.

Bell, Lon E., to Technar Incorporated. Crash and rollover cutoff switch. 4,255,629, Cl. 200-61.45R.

Bell Telephone Laboratories, Incorporated: *See—*
Bloom, David M.; and Mollenauer, Linn F., 4,255,719, Cl. 331-94.50F.
Gabbe, John D.; Judice, Charles N.; and London, Thomas B., 4,255,796, Cl. 364-900.000.
Hasegawa, Akira, 4,255,017, Cl. 350-96.290.
Maxemchuk, Nicholas F.; and Stuller, John A., 4,255,763, Cl. 358-135.000.
Smith, Arnold R., 4,254,547, Cl. 29-857.000.
Wilson, Thomas G., Jr., 4,255,721, Cl. 331-111.000.

Bellus, Daniel: *See—*
Martin, Pierre; Greuter, Hans; and Bellus, Daniel, 4,255,351, Cl. 260-456.00R.

Bellut, Heinrich: *See—*
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Bendix Corporation, The: *See—*
Casey, Gary L.; Blatter, Albert; Miller, John A.; and Claxton, William B., 4,254,653, Cl. 73-3.000.
Dressel, Michael O., 4,254,638, Cl. 64-2.00P.
Gaiser, Robert F., 4,254,624, Cl. 60-574.000.
Hartford, Thomas W.; Johnson, Edwin A.; and Russo, Frank A., 4,255,789, Cl. 364-431.000.
Snyder, Gene L.; and MacAvoy, David W., 4,255,008, Cl. 339-89.00M.

Benedetto, Kenneth R.; and Linder, Larry J., to KBG Corporation. Fluid dynamic angular rate sensor. 4,254,659, Cl. 73-516.0LM.

Benjamin, Braham, to Celanese Corporation. Fluid coupling seal. 4,254,973, Cl. 285-312.000.

Benzschawel, Steven J.: *See—*
Foote, Allan E.; and Benzschawel, Steven J., 4,254,870, Cl. 206-524.000.

Berek, Dusan; and Novak, Ivan, to Urad Predsednictva Slovenskej Akademie. Process of preparing spherical microparticles. 4,255,286, Cl. 252-448.000.

Berg, William E., to Tektronix, Inc. Electrical connector. 4,255,003, Cl. 339-17.0LM.

Berger, Jean-Luc; and Coutures, Jean-Louis, to Thomson-CSF. Semiconductor phase shift device for a charge transfer filter. 4,255,676, Cl. 307-262.000.

Berger, Jean-Luc; and Coutures, Jean-Louis, to Thomson-CSF. Differential device using charge transfer devices, a filter and delay line comprising this device. 4,255,725, Cl. 333-165.000.

Bergero, Jean-Pierre, to Thomson-CSF. Distortion-corrector for microwave tubes. 4,255,724, Cl. 333-17.00L.

Bergeron, Gregory: *See—*
Mims, Matlock M., 4,254,770, Cl. 128-229.000.

Bergfeld, Jost; Raasch, Marie-Luise; Konig, Ingo; and Brussow, Klaus-Peter, to VEB Berlin-Chemie. Hormone combination and method for stimulation of ovulation. 4,255,420, Cl. 424-177.000.

Bergstedt, Dan; and Johansson, Anders E. B., to Saab-Scania AB. Turbo charging systems. 4,254,625, Cl. 60-602.000.

Bergwerksverband GmbH: *See—*
Gappa, Gunther; Juntgen, Harald; Klein, Jurgen; and Schulz, Peter, 4,255,072, Cl. 406-89.000.

Berna, Emil; and Toedtli, Sergej, to Georg Fischer AG. Barrel-type shot blasting machine. 4,254,592, Cl. 51-423.000.

Bernard, Paul; and Zenatti, Daniel, to Commissariat a l'Energie Atomique. Method of producing Josephson-effect junctions. 4,255,465, Cl. 427-62.000.

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Cederqvist, Nils G.; Hellsten, Karl M. E.; Henriksson, Kerstin E.; and Waag, Lars A. S., 4,254,823, Cl. 165-55.000.

Bertus, Brent J.; and McKay, Dwight L., to Phillips Petroleum Company. Cracking catalyst. 4,255,287, Cl. 252-455.00Z.

Bessin, Pierre A. R.: *See—*
Thuillier nee Nachmias, Germaine; Laforest nee Boutillier du Retail, Jacqueline S.; Cariou, Bernard J. M.; Bessin, Pierre A. R.; Bonnet nee Roux, Jacqueline S.; and Thuillier, Jean E., 4,255,585, Cl. 549-58.000.

Betz Laboratories, Inc.: *See—*
Klaessig, Frederick C.; and Jacques, Donald F., 4,255,309, Cl. 260-29.6WB.

Bez, Ulrich: *See—*
Buhren, Wolfgang; Hoefs, Rainer; and Bez, Ulrich, 4,254,518, Cl. 5-450.000.

Bhattacharya, Debanshu; Quinto, Dennis T.; and Holowaty, Michael O., to Inland Steel Company. Bismuth-containing steel. 4,255,187, Cl. 75-123.0AA.

Bi-M Instrument Company: *See—*
Mayeaux, Paul H., 4,254,797, Cl. 137-565.000.

Bianchi, Nereo, to Necchi Societa per Azioni. Electromechanical actuator applied to an electronically controlled sewing machine. 4,254,720, Cl. 112-158.00E.

Bickel, Hans: *See—*
Woodward, Robert B.; and Bickel, Hans, 4,255,328, Cl. 260-239.00A.

Bikbau, Marsel Y.: *See—*
Nudelman, Boris I.; Gadaev, Anatoly Y.; Bikbau, Marsel Y.; and Shishkin, Petr T., 4,255,201, Cl. 106-106.000.

Bilak, William. Stamped bevel gear. 4,254,540, Cl. 29-159.200.

Binet, Daniel: *See—*
Dawans, Francois; and Binet, Daniel, 4,255,524, Cl. 521-54.000.

Birx, Daniel L., to United States of America, Navy. Intense electron beam microwave switch. 4,255,731, Cl. 333-258.000.

Bishilany, William J., III; Buehl, Arnold L.; and Zwipf, Werner H., to Slyman Manufacturing Corporation. Non-warping radiant burner construction. 4,255,123, Cl. 431-328.000.

Bjerklie, John W.: *See—*
LaHaye, Paul G.; Bjerklie, John W.; Most, Ivan G.; and Hagen, Kenneth G., 4,254,715, Cl. 110-300.000.

Bjorkland, Mats E. Method and apparatus for manufacturing signs or the like carrying information which is different for different viewing angles. 4,255,380, Cl. 264-505.000.

Bjorklund, Lars-Ake: *See—*
Arnoldsson, Erik; and Bjorklund, Lars-Ake, 4,254,874, Cl. 209-3.000.

Bjorkman, Karl-Ake G., to Lumalampan AB. Apparatus for removing mercury from solid waste material. 4,254,943, Cl. 266-149.000.

Black Clawson Fibreclaim Inc.: *See—*
Marsh, Paul G., 4,254,878, Cl. 209-682.000.

Blackwell, Henry W., to Dresser Industries, Inc. Swab cup having long and short reinforcing members. 4,254,962, Cl. 277-181.000.

Blake, Walter R.: *See—*
Plemmons, Jerry R.; and Blake, Walter R., 4,255,781, Cl. 362-374.000.

Blankenhorn, James C.: *See—*
White, Lionel S., Jr.; and Blankenhorn, James C., 4,255,679, Cl. 307-355.000.

Blatt, Leland F. Lapped spool valve assembly. 4,254,799, Cl. 137-625.690.

Blatter, Albert: *See—*
Casey, Gary L.; Blatter, Albert; Miller, John A.; and Claxton, William B., 4,254,653, Cl. 73-3.000.

Bleymaier, Joseph S.; Farnworth, Wilfred; and Peters, Thomas E., to Morrison-Knudsen Forest Products Company, Inc. Furnish handling apparatus. 4,255,108, Cl. 425-174.80E.

Blizzard, John D., to Dow Corning Corporation. Ceramifiable silicone adhesives. 4,255,316, Cl. 260-37.0SB.

Block, Jacob, to W. R. Grace & Co. Drilling mud viscosifier. 4,255,268, Cl. 252-8.50B.

Blonski, Paul, to Hyde Products, Inc. Method of making forestay connector. 4,254,543, Cl. 29-517.000.

Bloom, David M.; and Mollenauer, Linn F., to Bell Telephone Laboratories, Incorporated. Maintenance of optimal orientation in F_2^+ color center lasers. 4,255,719, Cl. 331-94.50F.

Bloom, Melvin S.: *See*—
Van Allan, James A.; Rossi, Louis J.; Bloom, Melvin S.; Regan, Michael T.; Wright, Hal E.; and Kaukeinen, Joseph Y., 4,255,506, Cl. 430-41.000.
Blouin, Florine A.: *See*—
Rowland, Stanley P.; Blouin, Florine A.; and Shih, Frederick F., 4,255,149, Cl. 8-184.000.
Bluewater Terminal Systems N.V.: *See*—
van Heijst, Willem J., 4,254,522, Cl. 9-8.00P.
Blundell, Stephen J.; and Turner, Charles W., to EMI Limited. Detectors of penetrating radiation. 4,255,660, Cl. 250-370.000.
Boba, Joseph; Conger, Robert P.; and Pedrick, William H., to Congoleum Corporation. Carpet etching. 4,255,231, Cl. 156-645.000.
Bochumer Eisenhutte Heintzmann GmbH & Co.: *See*—
Guse, Kuno; and Schmitjans, Josef, 4,254,995, Cl. 299-17.000.
Koppers, Manfred; Spies, Klaus; and Bohnes, Karlheinz, 4,255,071, Cl. 405-290.000.
Boehringer Ingelheim GmbH: *See*—
Koppe, Herbert; Mentrup, Anton; Renth, Ernst-Otto; Schromm, Kurt; Hoefke, Wolfgang; and Muacevic, Gojko, 4,255,430, Cl. 424-258.000.
Boeing Company, The: *See*—
Wright, Charles P.; and Thornock, Russel L., 4,254,620, Cl. 60-263.000.
Bogdanovic, Borislav: *See*—
Wilke, Gunther; Bogdanovic, Borislav; and Pauling, Horst, 4,255,595, Cl. 568-821.000.
Bohm, John D.; and Hunter, James B., to Johnson Matthey, Inc. Platinum compounds for the irradication of skin blemishes. 4,255,417, Cl. 424-131.000.
Bohnes, Karlheinz: *See*—
Koppers, Manfred; Spies, Klaus; and Bohnes, Karlheinz, 4,255,071, Cl. 405-290.000.
Bohr, Carl W. Assembly line dairy barn. 4,254,736, Cl. 119-14.030.
Boise Cascade Corporation: *See*—
Westphal, Teddy M., 4,254,890, Cl. 220-276.000.
Bokros, Jack C., to Carbomedics, Inc. Bileaflet heart valve with improved pivot. 4,254,508, Cl. 3-1.500.
Bold, Stephen E., to British Petroleum Company Limited, The. Storage tank. 4,254,887, Cl. 220-85.00B.
Boldebuck, Edith M.; and Banucci, Eugene G., to General Electric Company. Coating solution of polyetherimide-forming monomers in a solvent system including water. 4,255,471, Cl. 427-385.500.
Bolin, Leonard E.; and Marcus, Randy L. X-ray shield stand. 4,255,667, Cl. 250-515.000.
Bollmann, Werner: *See*—
Rigler, Josef K.; Schafer, Wolfgang; Leithauser, Horst; Trukenbrod, Karl; and Bollmann, Werner, 4,255,525, Cl. 521-57.000.
Bom, Cornelis J. G.: *See*—
van der Lely, Ary; and Bom, Cornelis J. G., 4,254,834, Cl. 172-112.000.
Bond, Armand P.; Bryhan, Anthony J.; and Redmond, James D., to Amax Inc. Ferritic stainless steel. 4,255,497, Cl. 428-685.000.
Bonnet nee Roux, Jacqueline S.: *See*—
Thuillier nee Nachmias, Germaine; Laforest nee Boutillier du Retail, Jacqueline S.; Cariou, Bernard J. M.; Bessin, Pierre A. R.; Bonnet nee Roux, Jacqueline S.; and Thuillier, Jean E., 4,255,585, Cl. 549-58.000.
Bookwalter, John R.: *See*—
McCready, James F.; Bookwalter, John R.; Downing, Roy W.; and Guay, George W., 4,254,763, Cl. 128-20.000.
Boonstra, Lieuwe; Lambrechtse, Cornelis W.; Salters, Roelof H. W.; and Wijnhoven, Rene M. G., to U.S. Philips Corporation. Charge pump substrate bias generator. 4,255,677, Cl. 307-304.000.
Boots Company Limited, The: *See*—
Watkins, Thomas I.; and Weighton, David M., 4,255,435, Cl. 424-269.000.
Boretos, John W., to United States of America, Health, Education and Welfare. Balloon catheter and technique for the manufacture thereof. 4,254,774, Cl. 128-348.000.
Borkat, Franklin R.; and Kataoka, Richard W., to United States of America, Navy. Overlay data entry device for automated data systems. 4,255,653, Cl. 235-495.000.
Borner, Frau E.: *See*—
Tesmann, Holger; Rutzen, Horst; and Borner, Frau E., 4,255,450, Cl. 424-320.000.
Borrman, Bo, to AB Asea-Atom. Yoke-like attachment assembly. 4,254,982, Cl. 294-81.00R.
Borsuk, Leslie M., to International Telephone and Telegraph Corporation. Fiber optic connector. 4,255,016, Cl. 350-96.210.
Bosch, Mahlon L.; and Kehl, Jason S., to A. B. Chance Company. Temporary electrical grounding rod barricade apparatus. 4,255,608, Cl. 174-5.00R.
Boughton, Kenneth W.: *See*—
Wiedenbeck, Roger D.; Boughton, Kenneth W.; and Maurer, Richard, 4,254,972, Cl. 285-61.000.
Bounds, Edward G. Method for galvanizing seafood pots. 4,255,467, Cl. 427-142.000.
Boutboul, Pierre A.: *See*—
Lebrun, Henri V.; and Boutboul, Pierre A., 4,254,912, Cl. 239-183.000.
Bouts, Melvin L.: *See*—
Skifano, Anthony J.; and Bouts, Melvin L., 4,255,127, Cl. 432-3.000.
Boyer, Kenneth W.: *See*—
Schachter, Myron M.; and Boyer, Kenneth W., 4,255,386, Cl. 422-101.000.
Boynton, Wilson C. Trash bag filling device. 4,254,602, Cl. 53-390.000.
Bozik, John E.: *See*—
Wu, Ching-Yong; Kobylinski, Thaddeus P.; and Bozik, John E., 4,255,596, Cl. 568-860.000.
Wu, Ching-Yong; Kobylinski, Thaddeus P.; and Bozik, John E., 4,255,599, Cl. 585-319.000.
Bradshaw, John: *See*—
Price, Barry J.; Clitherow, John W.; and Bradshaw, John, 4,255,440, Cl. 424-274.000.
Braithwaite, David, to Emhart Industries, Inc. Glassware forming machines. 4,255,178, Cl. 65-79.000.
Brandenburg, John T.: *See*—
Mayer, Edward A.; and Brandenburg, John T., 4,255,173, Cl. 55-329.000.
Brandenstein, Manfred: *See*—
Olschewski, Armin; Walter, Lothar; Brandenstein, Manfred; Kunkel, Heinrich; and Norlander, Gosta, 4,255,000, Cl. 308-8.200.
Brandes, Wilhelm: *See*—
Knops, Hans-Joachim; Brandes, Wilhelm; and Paul, Volker, 4,255,437, Cl. 424-270.000.
Kramer, Wolfgang; Buchel, Karl; Frohberger, Paul-Ernst; Brandes, Wilhelm; and Scheinpflug, Hans, 4,255,434, Cl. 424-269.000.
Branlard, Paul; and Merle, Jean-Pierre, to Distugil. Method of preparing sulfur-modified polychloroprene. 4,255,539, Cl. 525-330.000.
Branner-Jorgensen, Sven, to Branner-Jorgensen, Sven. Thermal destabilization of microbial rennet. 4,255,454, Cl. 426-36.000.
Brasen, Wallace R., to Du Pont de Nemours, E. I., and Company. Water based acrylic lacquer composition. 4,255,308, Cl. 260-29.6RW.
Bratkowski, Walter V.: *See*—
Wafer, John A.; Bratkowski, Walter V.; and Lang, Walter W., 4,255,732, Cl. 335-16.000.
Brauch, Paul J.; and Szymaszek, Paul G., to Vilter Manufacturing Corporation. Refrigeration system with refrigerant cooling of compressor and its oil. 4,254,637, Cl. 62-468.000.
Braun Aktiengesellschaft: *See*—
Fahrenschon, Kurt; and Nickol, Friedrich W., 4,255,806, Cl. 368-240.000.
Braun, Gunther. Braking system for construction machines. 4,254,845, Cl. 180-306.000.
Braunschweigische Maschinenbauanstalt: *See*—
Ries, Walter, 4,255,232, Cl. 159-47.00R.
Breckel, Werner, to Robert Bosch GmbH. Reference signal processor circuit. 4,255,778, Cl. 361-236.000.
Brecker, Lawrence R.; and Keeley, Charles, to Argus Chemical Corporation. Mixture of alkyltin sulfides and alkyltin 2-acyloxyethylmercaptides as stabilizer compositions for polyvinyl chloride resin compositions. 4,255,320, Cl. 260-45.750.
Breen, Thomas B., to General Electric Company. Static instantaneous overcurrent relay with low transient overreach. 4,255,774, Cl. 361-95.000.
Brennan, Edward J., to Koehler-Dayton, Inc. Aircraft seat. 4,254,924, Cl. 244-122.00R.
Brentham, Jerry D. Leg curl exercising device. 4,254,949, Cl. 272-130.000.
Bressler, Peter W., to Litton Systems, Inc. Door mounted oven controls. 4,255,640, Cl. 219-10.55B.
Bridges, Carroll M.: *See*—
Marlow, James T.; and Bridges, Carroll M., 4,254,675, Cl. 81-63.000.
Bridgestone Tire Company Limited: *See*—
Ogawa, Masaki; and Araki, Tamio, 4,255,296, Cl. 260-5.000.
Yukuta, Toshio; Fukuda, Hiroya; and Ishii, Seiji, 4,255,526, Cl. 521-108.000.
British Petroleum Company Limited, The: *See*—
Bold, Stephen E., 4,254,887, Cl. 220-85.00B.
Brode, David A., to Crompton & Knowles Corporation. Direct black dye. 4,255,327, Cl. 260-173.000.
Broetto, Costantino, to Fratelli Borletti S.p.A. Insufficient pressure detector device for motor vehicle tires. 4,255,628, Cl. 200-61.250.
Bron, Dan. Flow rate regulator. 4,254,791, Cl. 137-118.000.
Brown, Gary L.; Warner, David F.; and Byon, Jae H., to Union Carbide Corporation. Exothermic polymerization in a vertical fluid bed reactor system containing cooling means therein and apparatus therefor. 4,255,542, Cl. 526-88.000.
Brown, John S.: *See*—
Lang-Ree, Nils; Brown, John S.; and Baker, Edward D., 4,254,697, Cl. 99-387.000.
Brown, Ronald E.; and Grinwis, Jack M. Limb protective coverings. 4,254,765, Cl. 128-82.000.
Brown, Thomas H.; Durant, Graham J.; and Ganellin, Charon R., to Smith Kline & French Laboratories Limited. 5-(Hydroxypyridylalkyl)-4-pyrimidones. 4,255,428, Cl. 424-251.000.
Bruggeman, Robert J.: *See*—
Coqueugniot, Annick G.; Bruggeman, Robert J.; and Piteau, Marc D., 4,255,243, Cl. 204-159.150.
Brunelle, Jean-Pierre, to Rhone-Poulenc Industries. Non-polluting oxyhydrochlorination process. 4,255,359, Cl. 570-243.000.
Bruno, Maria T. Footwear and method of manufacture thereof. 4,254,563, Cl. 36-9.00R.
Brunsch, Klaus: *See*—
Wackerle, Peter M.; Brunsch, Klaus; and Grober, Josef, 4,255,087, Cl. 416-230.000.
Brunsden, Barry S., to United States of America, Energy. Optical device with conical input and output prism faces. 4,255,021, Cl. 350-286.000.

Brush, Charles K.; and Weinstock, Joseph, to SmithKline Corporation. 8-Hydroxy-6,7-(2-methyl-2,3-dihydrofuro)-1-phenyl-2,3,4,5-tetrahydro-1H-3-benzazepines. 4,255,445, Cl. 424-285.000.

Brussen, Reinier W., to General Electric Company. Stabilized polyphenylene ether. 4,255,321, Cl. 260-45.75W.

Brussow, Klaus-Peter: *See*—
Bergfeld, Jost; Raasch, Marie-Luise; Konig, Ingo; and Brussow, Klaus-Peter, 4,255,420, Cl. 424-177.000.

Bryhan, Anthony J.: *See*—
Bond, Armand P.; Bryhan, Anthony J.; and Redmond, James D., 4,255,497, Cl. 428-685.000.

Bubley, Henry J.; Krutsch, John R.; and Oltra, Claude H., to American Screen Printing Equipment Company. Mechanical drive screen printing press. 4,254,708, Cl. 101-123.000.

Buchel, Karl: *See*—
Kramer, Wolfgang; Buchel, Karl; Frohberger, Paul-Ernst; Brandes, Wilhelm; and Scheinpflug, Hans, 4,255,434, Cl. 424-269.000.

Buckley, Alan: *See*—
Daumit, Gene P.; Buckley, Alan; and Davis, Gerald W., 4,255,377, Cl. 264-176.00F.

Buehl, Arnold L.: *See*—
Bishilany, William J., III; Buehl, Arnold L.; and Zwipf, Werner H., 4,255,123, Cl. 431-328.000.

Buehler, Charles K.: *See*—
Rogan, John B.; and Buehler, Charles K., 4,255,281, Cl. 252-429.00B.

Buergel, George K. Sliding-valve in a heating-chamber combustion engine. 4,254,628, Cl. 60-682.000.

Buhler, Karl, to BBC Brown Boveri & Company Limited. Furnace tilting device. 4,255,126, Cl. 432-1.000.

Buhler, Philip H., III, to Edwards, David. Cash register power supply system. 4,255,697, Cl. 320-6.000.

Buhren, Wolfgang; Hoefs, Rainer; and Bez, Ulrich, to Dr. Ing. hc.F. Porsche Aktiengesellschaft. Vacuum mattress, preferably for rescue vehicles. 4,254,518, Cl. 5-450.000.

Bulteau, Gerard: *See*—
Thominet, Michel; Bulteau, Gerard; Acher, Jacques; and Colignon, Claude, 4,255,580, Cl. 546-197.000.

Bunia, Roderick J. Sump pump level warning device. 4,255,747, Cl. 340-624.000.

Bunker, Carroll C.: *See*—
O'Cheskey, Theodore H.; and Bunker, Carroll C., 4,255,262, Cl. 210-221.200.

Burco (Proprietary) Limited: *See*—
Katcs, Michael W.; De Luca, Peter J.; and Pretorius, Peter S., 4,254,863, Cl. 206-216.000.

Burgess, David. Non-light producing phosphor energizable lamp simulator and methods of using same and making same. 4,255,692, Cl. 315-324.000.

Burk, Emmett H., Jr.: *See*—
Sun, Jui-Yuan; Burk, Emmett H., Jr.; Yoo, Jin S.; and Masologites, George P., 4,255,156, Cl. 44-1.0SR.

Burke, Oliver W., Jr.; and Hunt, Barbara P., to Darrah, Marion; and Houghton, Joseph Y., co-trustees. Methods and means for improvings resin bonds between substrates, and materials therefor and products therefrom. 4,255,486, Cl. 428-356.000.

Burkey, Bruce C.: *See*—
Zeitzoff, Peter M.; Lee, Teh-Hsuang; Burkey, Bruce C.; Khosla, Rajinder P.; and Kelly, Thomas M., 4,255,760, Cl. 358-41.000.

Burnett, Louis E.: *See*—
Prager, Edward N.; and Burnett, Louis E., 4,254,601, Cl. 53-133.000.

Burnham, Robert D.: *See*—
Scifres, Donald R.; Streifer, William; and Burnham, Robert D., 4,255,717, Cl. 331-94.50H.

Burns, Charles F., to Pennwalt Corporation. Homogenous bonding of dispersed phase alloy. 4,255,192, Cl. 75-169.000.

Burroughs Corporation: *See*—
Beery, Jack, 4,255,061, Cl. 400-124.000.

Burroughs Wellcome Co.: *See*—
Morrison, Robert W., Jr.; Mallory, William R.; and Styles, Virgil L., 4,255,427, Cl. 424-251.000.

Bushman, James B.: *See*—
Kroon, David H.; Bushman, James B.; and Rog, Joseph W., 4,255,241, Cl. 204-147.000.

Butter, Stephen A.; and Chester, Arthur W., to Mobil Oil Corporation. Conversion of synthesis gas with iron-containing catalyst. 4,255,349, Cl. 260-449.60R.

Butzke, Hilbert C.; and Harry, Dennis W., to Minnesota Mining and Manufacturing Company. Fining sheet and method of making and using the same. 4,255,164, Cl. 51-295.000.

Buzzard, Michael A.; and Gaylor, Ian Michael D., to Ratcliff Tail Lifts Limited. Safety devices for load lifting and lowering apparatus. 4,254,939, Cl. 254-89.00R.

Byon, Jae H.: *See*—
Brown, Gary L.; Warner, David F.; and Byon, Jae H., 4,255,542, Cl. 526-88.000.

Byrd, Norman R.; and Donahoe, John K., to McDonnell Douglas Corporation. Fire barrier compositions and composites. 4,255,483, Cl. 428-245.000.

C.E.P. Industries Limited: *See*—
Rath, Albert, 4,254,564, Cl. 37-42.0VL.

C. G. Bretting Mfg. Co. Inc.: *See*—
Trogan, John F., 4,254,947, Cl. 270-39.000.

C-R-O, Inc.: *See*—
Balfanz, Fredrick J., 4,255,643, Cl. 219-124.340.

C. van der Lely N.V.: *See*—
van der Lely, Ary; and Bom, Cornelis J. G., 4,254,834, Cl. 172-112.000.

Cahn, Arno: *See*—
Rudy, Jerome; Lazzara, Frederick; Cowles, Warren W.; and Cahn, Arno, 4,255,294, Cl. 252-524.000.

Calhoun, Walter L., to McNeil Corporation. Single-bolt roof suspension for overhead track. 4,255,070, Cl. 405-260.000.

Calvin, Noel M. Phase modulated power control. 4,255,699, Cl. 323-322.000.

Camco, Incorporated: *See*—
Watkins, Fred E., 4,254,829, Cl. 166-134.000.

Cametti, George M.: *See*—
Johnston, Robert J.; Layciak, Stephen G.; and Cametti, George M., 4,255,633, Cl. 200-153.00J.

Campbell, Dudley H.; Daggerhart, James A.; and Overton, Arthur W., to Stackpole Components Company. Keyswitch. 4,255,635, Cl. 200-159.00A.

Canon Kabushiki Kaisha: *See*—
Hanada, Hiroshi; Kitajima, Nobuo; and Masaki, Tatsuo, 4,255,505, Cl. 430-31.000.
Koumura, Noboru; Komatsu, Toshiyuki; Nakagawa, Katsumi; Takekawa, Nobuhiro; and Fujii, Motoharu, 4,255,041, Cl. 355-3.00R.
Matsumoto, Kazuya; Matsumura, Susumu; and Suzuki, Takashi, 4,255,032, Cl. 354-53.000.
Ohara, Katsunobu; Tanaka, Keiji; Ando, Yujiro; and Moriyama, Inao, 4,255,507, Cl. 430-53.000.

Cantelli, Paolo, to Fiat Srl. Apparatus for neutralizing electrostatic charges and for removing dust from various objects. 4,255,776, Cl. 361-213.000.

Capozziello, David J.: *See*—
Capozziello, Leonard J.; and Capozziello, David J., 4,254,867, Cl. 206-322.000.

Capozziello, Leonard J.; and Capozziello, David J. Package and method for transporting loose brick. 4,254,867, Cl. 206-322.000.

Carau, Frank P., Sr.; Hetzel, Henry T.; and Tremblay, Michael A., to Hewlett-Packard Company. Travelling wave digitizer. 4,255,617, Cl. 178-19.000.

Carbomedics, Inc.: *See*—
Bokros, Jack C., 4,254,508, Cl. 3-1.500.

Cariou, Bernard J. M.: *See*—
Thuillier nee Nachmias, Germaine; Laforest nee Boutillier du Retail, Jacqueline S.; Cariou, Bernard J. M.; Bessin, Pierre A. R.; Bonnet nee Roux, Jacqueline S.; and Thuillier, Jean E., 4,255,585, Cl. 549-58.000.

Carley, Emilie L.: *See*—
Eustance, John W.; Hobbs, Stanley Y.; and Carley, Emilie L., 4,255,381, Cl. 264-519.000.

Carpenter, David A.: *See*—
Kossoff, George; and Carpenter, David A., 4,254,661, Cl. 73-625.000.

Carpigiani Bruto Macchine Automatiche S.p.A.: *See*—
Manfroni, Ezio, 4,255,060, Cl. 366-137.000.

Carr, Norman L.; and McGinnis, Edgar L., to Gulf Research & Development Company. Filtration of a coal liquid slurry using an alkylmethacrylate copolymer and an alcohol. 4,255,258, Cl. 210-727.000.

Carrico, Robert J.; and Johnson, Richard D., to Miles Laboratories. Flavin adenine dinucleotide derivatives and labeled conjugates prepared therefrom. 4,255,566, Cl. 536-27.000.

Carrier Corporation: *See*—
Geary, David F., 4,254,630, Cl. 62-79.000.
Leonard, Gary S.; and Eckman, Raymond L., 4,254,631, Cl. 62-117.000.
Zinsmeyer, Thomas M.; and Leonard, Gary S., 4,254,632, Cl. 62-117.000.

Carson, John R., to McNeilab, Inc. Preparation of 5-aroyl-1-loweralkylpyrrole-2-acetic acid derivatives. 4,255,335, Cl. 260-326.470.

Carthew, Maximilian K., to Schweitzer Industrial Corp. Incinerator-heater system. 4,255,132, Cl. 432-21.000.

Casey, Gary L.; Blatter, Albert; Miller, John A.; and Claxton, William B., to Bendix Corporation, The. Electromagnetic fuel injector calibration. 4,254,653, Cl. 73-3.000.

Casteel, Robert F. Traffic signal with time duration indicator and mechanical synchronization. 4,255,737, Cl. 340-43.000.

Castells, Onofre T. M.: *See*—
Giffin, Rollin G., III; and Castells, Onofre T. M., 4,254,619, Cl. 60-226.00R.

Castner, Charles S.: *See*—
Vick, James A.; and Castner, Charles S., 4,254,519, Cl. 6-12.00R.

Castrol Limited: *See*—
Harrington, Colin J.; and Askew, Herbert F., 4,255,586, Cl. 556-402.000.

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Grim, George B., 4,255,135, Cl. 432-107.000.
Kessinger, Orville E.; and Lamport, Ivan R., 4,254,668, Cl. 74-572.000.

Cavazza, Claudio. Method of treating abnormal lipoprote in ratios. 4,255,449, Cl. 424-316.000.

Cavicchioli, Ugo: *See*—
Germano, Francesco; and Cavicchioli, Ugo, 4,254,554, Cl. 33-174.00L.

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Naylor, Thomas K.; and Cavigelli, George A., 4,255,769, Cl. 360-65.000.

Cederqvist, Nils G.; Hellsten, Karl M. E.; Henriksson, Kerstin E.; and Waag, Lars A. S., to Berol Kemi AB. Process for separating mineral wool fibers from nonfibrous materials. 4,254,823, Cl. 165-55.000.

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Benjamin, Braham, 4,254,973, Cl. 285-312.000.
Soehngen, John W., 4,255,376, Cl. 264-145.000.

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Thuillier nee Nachmias, Germaine; Laforest nee Boutillier du Retail, Jacqueline S.; Cariou, Bernard J. M.; Bessin, Pierre A. R.; Bonnet nee Roux, Jacqueline S.; and Thuillier, Jean E., 4,255,585, Cl. 549-58.000.

Centro Ricerche Fiat S.p.A.: *See—*
Conti, Luigi, 4,254,751, Cl. 123-281.000.
Leonardis, Raffaele, 4,254,987, Cl. 296-178.000.

Cervenka, Juraj; Psenica, Jan; Horak, Miroslav; and Horak, Jiri, to Prvni brnenska strojirna, narodni podnik. Tube bending device. 4,254,649, Cl. 72-128.000.

Cessna Aircraft Company, The: *See—*
Alexander, Frank N., 4,254,687, Cl. 91-29.000.

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Wood, Lindley S.; Tracy, David J.; and Chakbrabarti, Paritosh M., 4,255,561, Cl. 528-388.000.

Chamberlin, George P., to Motorola, Inc. Microprocessor having instruction fetch and execution overlap. 4,255,785, Cl. 364-200.000.

Chambersburg Engineering Company: *See—*
Rickrode, Jack A.; and Frame, Charles W., 4,254,663, Cl. 73-714.000.

Chandler, James D. Locking gas tank cap. 4,254,888, Cl. 220-85.00P.

Chandler, John E.; and Lenz, Robert W., to Exxon Research & Engineering Co. Crystalline co-polybenzyls. 4,255,562, Cl. 528-397.000.

Channell, William H. Method and apparatus for enclosing a cable splice. 4,255,614, Cl. 174-93.000.

Chapa-Martinez, Leobardo: *See—*
Flores-Verdugo, Marco A.; Chapa-Martinez, Leobardo; and Price-Falcon, Juan F., 4,254,876, Cl. 209-577.000.

Chapman Chemical Company: *See—*
Nagel, Fritz J., 4,255,593, Cl. 568-776.000.

Chappell, Terry I.; and White, Richard M., to University of California, The Regents of the. Method of fabricating photovoltaic cells. 4,255,212, Cl. 148-1.500.

Charlebois, Leonard J.; and Kho, James K., to Northern Telecom Limited. Telecommunications cable with grounding installations at spaced intervals and method of making same. 4,255,609, Cl. 174-41.000.

Chase, Charles P.; and Link, William J., to Heyer-Schulte Corporation. Intraocular lens with noncircular eye engaging retention means. 4,254,511, Cl. 3-13.000.

Cheak, Edward G., to Norfield Manufacturing Co. Apparatus for automatic alignment and attachment of a doorjamb and stop. 4,254,895, Cl. 227-50.000.

Chemed Corporation: *See—*
Hwa, Chih M.; and Cuisia, Dionisio G., 4,255,259, Cl. 210-699.000.

Chemische Werhe Huls AG: *See—*
Rigler, Josef K.; Schafer, Wolfgang; Leithauser, Horst; Trukenbrod, Karl; and Bollmann, Werner, 4,255,525, Cl. 521-57.000.

Chemische Werke Huls AG: *See—*
Coenen, Alfred; Kosswig, Kurt; Von Praun, Ferdinand; and Schuller, Hans-Peter, 4,255,356, Cl. 564-499.000.
Wolf, Elmar; Obendorf, Johann; and Gras, Rainer, 4,255,551, Cl. 528-45.000.

Chen, Cheng-lin, to Westinghouse Electric Corp. Isotopic separation. 4,255,404, Cl. 423-258.000.

Cheng, Richard C. M. Model vehicle. 4,254,577, Cl. 46-258.000.

Chester, Arthur W.: *See—*
Butter, Stephen A.; and Chester, Arthur W., 4,255,349, Cl. 260-449.60R.

Chevin, Sidney; and Fisher, Philip S., to Studio 21 (Sales) Ltd. Photographic printing of superimposed images. 4,255,047, Cl. 355-79.000.

Chevron Research Company: *See—*
Guenther, Lloyd M., 4,255,222, Cl. 156-433.000.
Magee, Philip S., 4,255,451, Cl. 424-337.000.
McCoy, Charles S., 4,255,250, Cl. 208-64.000.
Rosenthal, Joel W.; Dahlberg, Arthur J.; and Kuehler, Christopher W., 4,255,248, Cl. 208-8.0LE.

Chiang, Peter T., to Wyoming Mineral Corp. Method of separating iron from uranium. 4,255,392, Cl. 423-11.000.

Chiang, Peter T., to Westinghouse Electric Corp. Method of precipitating ADU. 4,255,393, Cl. 423-15.000.

Chiba, Shoichi; Konuma, Kunio; and Ishizaki, Hirofumi, to Honda Giken Kogyo Kabushiki Kaisha. Means silencing suction noise in internal combustion engines. 4,254,746, Cl. 123-52.00M.

Chiba, Takehisa: *See—*
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Chiminter: *See—*
Cretin, Bertrand; and Godefroy, Andre M., 4,254,513, Cl. 4-231.000.

Cho, Tae H.: *See—*
Han, Joon H.; and Cho, Tae H., 4,254,843, Cl. 180-165.000.

Chrai, Sukhbir S.; Gupta, Santosh; and Hensley, Michael J., to Schering Corporation. Polyvinyl alcohol ophthalmic gel. 4,255,415, Cl. 424-78.000.

Christensen, Burton G.; and DiNinno, Frank P., to Merck & Co., Inc. Process for preparing 6-substituted amino-2-substituted-pen-2-em-3-carboxylic acid. 4,255,330, Cl. 260-239.100.

Christensen, Calvin J.: *See—*
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Christensen, Donald R.: *See—*
Stanford, Ralph F.; and Christensen, Donald R., 4,254,896, Cl. 222-108.000.

Christophliemk, Peter; Oezelli, Riza N.; and Tischbirek, Guenther, to Henkel Kommanditgesellschaft auf Aktien (Henkel KGaA). Process for preparing organosilazanes. 4,255,549, Cl. 528-28.000.

Chromatex, Inc.: *See—*
Hill, Philip R., 4,255,227, Cl. 156-555.000.

Church, Delmar F.: *See—*
Hensler, Paul L.; Church, Delmar F.; and Beger, Robert W., 4,255,274, Cl. 252-135.000.

Ciba-Geigy AG: *See—*
Eisenberg, Benjamin, 4,255,045, Cl. 355-37.000.
Huggins, Peter N., 4,254,918, Cl. 242-68.500.

Ciba-Geigy Corporation: *See—*
Albert, Alban; Courbat, Pierre; and Weith, Andre, 4,255,336, Cl. 260-345.200.
Babb, Robert M.; and Guillory, Melvin J., Jr., 4,255,167, Cl. 55-71.000.
Eldin, Sameer H.; and Gysin, Hanspeter, 4,255,311, Cl. 260-29.6NR.
Hewitt, Brian; Hobday, Cyril; Jack, James; and Keenan, John F. E., 4,255,152, Cl. 8-583.000.
Kane, Sydney H.; and Margulies, Erwin, 4,255,438, Cl. 424-273.00P.
Macpherson, Ian A.; Stirling, John A.; Wheeler, Ian R.; and McCrae, James M., 4,255,375, Cl. 264-117.000.
Martin, Pierre; Greuter, Hans; and Bellus, Daniel, 4,255,351, Cl. 260-456.00R.
Pfeifer, Josef, 4,255,559, Cl. 528-338.000.
Werner, Lincoln H., 4,255,429, Cl. 424-251.000.
Woodward, Robert B.; and Bickel, Hans, 4,255,328, Cl. 260-239.00A.
Zurbuchen, Jacques; and Dussy, Paul, 4,255,154, Cl. 8-638.000.

Cincotta, Louis; and Foley, James W., to Polaroid Corporation. Synthesis of perhalomethylcarbinol-substituted phenol and naphthol sulfamphthalein dyes from the corresponding triacylated derivatives. 4,255,578, Cl. 546-96.000.

Citizen Watch Co. Ltd.: *See—*
Ebihara, Heihachiro, 4,255,723, Cl. 331-116.0FE.
Ode, Sadao; and Hatuse, Toshikazu, 4,255,801, Cl. 368-1.00D.
Ogawa, Hiroshi, 4,255,802, Cl. 368-69.000.
Sekine, Mitsuo, 4,255,803, Cl. 368-72.000.
Suganuma, Kunio, 4,255,804, Cl. 368-84.000.

Clafford, Arthur H., to AMSTED Industries Incorporated. Damping railway truck friction shoe. 4,254,713, Cl. 105-197.0DB.

Clark, Donald R., to AMP Incorporated. Two row electrical connector. 4,255,009, Cl. 339-97.00P.

Clark, Roger T.: *See—*
Gardner, David A.; and Clark, Roger T., 4,255,357, Cl. 564-480.000.

Claxton, George P.: *See—*
Grisar, J. Martin; and Claxton, George P., 4,255,575, Cl. 544-394.000.

Claxton, William B.: *See—*
Casey, Gary L.; Blatter, Albert; Miller, John A.; and Claxton, William B., 4,254,653, Cl. 73-3.000.

Cleveland, John F.: *See—*
Harris, Richard W.; Cleveland, John F.; and Lott, Thomas M., 4,255,620, Cl. 179-15.55R.

Clitherow, John W.: *See—*
Price, Barry J.; Clitherow, John W.; and Bradshaw, John, 4,255,440, Cl. 424-274.000.

Close, Thomas E.: *See—*
Vogel, Walter H.; and Close, Thomas E., 4,254,604, Cl. 53-566.000.

Clouser, David E.; and Craven, John S., to Hewlett-Packard Company. Modulated fluid detector. 4,254,654, Cl. 73-27.00R.

Clow, Hugh; Walters, Peter E.; and Percival, Wiliam S., to EMI Limited. Imaging systems. 4,254,778, Cl. 128-653.000.

Coakley, Thomas A.; Rubadue, John E.; Forman, Carl E.; and Schweizer, Robert A., to Owens-Corning Fiberglas Corporation. Non-discoloring glass strand size. 4,255,317, Cl. 260-37.00N.

Cochran, Charles R. Hair roller fastener. 4,254,785, Cl. 132-40.000.

Cocke, William A.: *See—*
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Codman & Shurtleff, Inc.: *See—*
McCready, James F.; Bookwalter, John R.; Downing, Roy W.; and Guay, George W., 4,254,763, Cl. 128-20.000.

Coenen, Alfred; Kosswig, Kurt; Von Praun, Ferdinand; and Schuller, Hans-Peter, to Chemische Werke Huls AG. Purification of tertiary amines using an adsorbent. 4,255,356, Cl. 564-499.000.

Cohen, Louis; Haehn, James B.; and Witenhafer, Donald E., to B. F. Goodrich Company, The. Process for preventing polymer buildup in a polymerization reactor. 4,255,470, Cl. 427-230.000.

Coker, George M., Jr.; and Rodriquez, Rodolfo R., to Baxter Travenol Laboratories, Inc. Drive for syringe pump. 4,255,096, Cl. 417-415.000.

Coli, Giuseppe: *See—*
Zaltieri, Adriano; and Coli, Giuseppe, 4,255,063, Cl. 400-568.000.

Collias, George J., to Kepros-Ganes Company. Method and apparatus for preventing buckle of beer cans during pasteurization. 4,255,457, Cl. 426-407.000.

Collignon, Claude: *See—*
Thominet, Michel; Bulteau, Gerard; Acher, Jacques; and Collignon, Claude, 4,255,580, Cl. 546-197.000.

Collonia, Harald, to VDO Adolf Schindling AG. Override controller for automatic motor vehicle speed control. 4,254,844, Cl. 180-179.000.

Combest, H. E. Buddy, to Aladdin Equipment Company. Submerged surface vacuum cleaner. 4,254,525, Cl. 15-1.700.

Comeau, Paul E., to Kenney Manufacturing Company. Curtain supporting and positioning combination. 4,254,815, Cl. 160-126.000.

Commissariat a l'Energie Atomique: *See—*
Bernard, Paul; and Zenatti, Daniel, 4,255,465, Cl. 427-62.000.
Delapierre, Gilles; and Meyer, Robert, 4,255,238, Cl. 204-18.100.

Commonwealth of Australia, The: *See—*
Kossoff, George; and Carpenter, David A., 4,254,661, Cl. 73-625.000.

Compagnie Generale des Etablissements Michelin: *See—*
Devaux, Edmond-Yves, 4,254,811, Cl. 152-209.00D.

Compagnie Generale pour les Developpements Operationnels des Richesses Sous-Marines "C.G. Doris": *See—*
Patinet, Jean-Francois, 4,254,728, Cl. 114-230.000.

Compagnie Internationale d'et de Realisations Electrotechniques: *See—*
Jullien, Eugenie L., 4,255,010, Cl. 339-176.00L.

Compagnie Internationale l'Informatique-CUU Honeywell Bull: *See—*
Delorme, Raymond L., 4,255,644, Cl. 219-233.000.

Compass Electronics Corporation: *See—*
Thompson, Fredrick H., 4,255,711, Cl. 324-329.000.

Conair Corporation: *See—*
King, Robert R., 4,255,006, Cl. 339-58.000.

Conant, Jay W.; Fisher, Donald W.; and Fox, David D., to International Business Machines Corporation. Pellicle ring removal method and tool. 4,255,216, Cl. 156-80.000.

Conger, Robert P.: *See—*
Boba, Joseph; Conger, Robert P.; and Pedrick, William H., 4,255,231, Cl. 156-645.000.

Congoleum Corporation: *See—*
Boba, Joseph; Conger, Robert P.; and Pedrick, William H., 4,255,231, Cl. 156-645.000.

Connell, Talbert D.; and Sims, Eugene F., to Crutcher Resources Corporation. Method of outside welding of pipelines. 4,255,641, Cl. 219-61.000.

Conrads, Hans, to Maschinenfabrik Carl Zangs Aktiengesellschaft. Method for the determination of the switching moments for special functions of automatic sewing-machines. 4,254,724, Cl. 112-262.100.

Container Corporation of America: *See—*
Foote, Allan E.; and Benzschawel, Steven J., 4,254,870, Cl. 206-524.000.

Contarino, Alfred F., to Alco Electronic Products, Inc. Miniature switch, sealed for soldering, with handle housing exposed. 4,255,638, Cl. 200-302.000.

Conti, Luigi, to Centro Ricerche Fiat S.p.A. Diesel engines. 4,254,751, Cl. 123-281.000.

Continental Group, Inc., The: *See—*
Fetters, Thomas T., 4,254,894, Cl. 222-1.000.

Continental Gummi-Werke Aktiengesellschaft: *See—*
Roker, Klaus-Dieter; Pehl, Wolfgang; and Reichenbach, Diethelm, 4,254,812, Cl. 152-211.000.

Contraves AG: *See—*
Guenin, Albert, 4,255,743, Cl. 340-347.0SY.
van Mansvelt, C. Friso; Ritter, Hansruedi; and Eicher, Walter, 4,255,765, Cl. 358-225.000.

Cook, James M., III; Foy, Dennis M.; and Shuert, Lyle H., to Oakland Plastics Corporation. Pallet. 4,254,873, Cl. 206-599.000.

Cooke, Donald R., to Padco, Inc. Paint-applying roller frame with paint drip catching shield. 4,254,529, Cl. 15-230.110.

Cooper, Irving. Means and method for aiding individuals to stop smoking. 4,255,439, Cl. 424-273.00R.

Cooperman, Michael, to GTE Laboratories Incorporated. Offset correction circuit for differential amplifiers. 4,255,715, Cl. 330-9.000.

Coqueugniot, Annick G.; Bruggeman, Robert J.; and Piteau, Marc D., to Societe Nationale des Poudres et Explosifs. Unsaturated poly-(carbonate-urethanes) and their applications to photocrosslinking. 4,255,243, Cl. 204-159.150.

Cormier, Raymond G.; Davis, Austin; Guiguizian, Jacques; Lutz, Leo O.; and Pauk, Henry T., to Nashua Corporation. Cleaning blade for electrophotography. 4,255,044, Cl. 355-15.000.

Corning Glass Works: *See—*
Danielson, Paul S.; Dumbaugh, William H., Jr.; and Hagy, Henry E., 4,255,198, Cl. 106-52.000.
Reade, Richard F., 4,255,199, Cl. 106-53.000.

Corona, Stephen C., to Xerox Corporation. Variable output power supply for flash unit. 4,255,046, Cl. 355-68.000.

Cosby, Phillip A., to Graham Magnetics Incorporated. Error testing of recording media such as magnetic tape. 4,255,807, Cl. 371-21.000.

Cosper, David R.: *See—*
Rende, Dominic S.; and Cosper, David R., 4,255,233, Cl. 162-73.000.

Costruzioni e Impianti S.p.A. Fiat Engineering: *See—*
Galimi, Giuseppe; Montalto, Mario; and Pluchino, Luciano, 4,255,263, Cl. 210-321.100.

Coulter Systems Corporation: *See—*
Kuehnle, Manfred R., 4,255,508, Cl. 430-94.000.
Weber, Harold J., 4,255,652, Cl. 235-451.000.

Courbat, Pierre: *See—*
Albert, Alban; Courbat, Pierre; and Weith, Andre, 4,255,336, Cl. 260-345.200.

Coutures, Jean-Louis: *See—*
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Berger, Jean-Luc; and Coutures, Jean-Louis, 4,255,725, Cl. 333-165.000.

Cowles, Warren W.: *See—*
Rudy, Jerome; Lazzara, Frederick; Cowles, Warren W.; and Cahn, Arno, 4,255,294, Cl. 252-524.000.

Cox, Eugene R.: *See—*
Morcom, William R.; Nicolay, Hugh C.; and Cox, Eugene R., 4,255,209, Cl. 148-175.000.

Crabtree, George F.: *See—*
Kerr, Robert M.; and Crabtree, George F., 4,254,946, Cl. 269-152.000.

Craig, Gerald V. Construction nut and bolt assembly and method of erecting structural steel. 4,254,542, Cl. 29-464.000.

Craig, Lynn W.: *See—*
Hunt, Walter H., IV; and Craig, Lynn W., 4,254,589, Cl. 51-318.000.

Crane, Robert L., to United States of America, Air Force. Composite structures. 4,255,478, Cl. 428-113.000.

Crankshaw, Michael: *See—*
Kucheck, Leo; and Crankshaw, Michael, 4,255,220, Cl. 156-285.000.

Craven, John S.: *See—*
Clouser, David E.; and Craven, John S., 4,254,654, Cl. 73-27.00R.

Crean, Peter A.; and Spencer, Paul R., to Xerox Corporation. Differential fiber optic sensing method and apparatus for ink jet recorders. 4,255,754, Cl. 346-75.000.

Crenshaw, William S. Anchoring apparatus. 4,254,730, Cl. 114-294.000.

Cretin, Bertrand; and Godefroy, Andre M., to Chiminter. Deodorant-product holder for a lavatory pan. 4,254,513, Cl. 4-231.000.

Creusot-Loire: *See—*
Maire, Jacques; and Pere, Gerard, 4,255,245, Cl. 204-257.000.
Rouby, Michel; and Eymery, Jean-Paul, 4,255,186, Cl. 75-122.000.

Crofts, Michael E.; Peevers, Michael S.; and Peevers, Eileen S., to Kew Research Limited. Devices for aiding the preparation of graphic artwork. 4,255,226, Cl. 156-541.000.

Crompton & Knowles Corporation: *See—*
Brode, David A., 4,255,327, Cl. 260-173.000.

Crosslen, Louis J. Removable cover for roof gutter. 4,254,595, Cl. 52-11.000.

Crummer, Robert R.: *See—*
Barkis, Edward; Crummer, Robert R.; and Joyner, James M., 4,255,323, Cl. 260-45.75N.

Crutcher Resources Corporation: *See—*
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Cuisia, Dionisio G.: *See—*
Hwa, Chih M.; and Cuisia, Dionisio G., 4,255,259, Cl. 210-699.000.

Cull, Neville L.; and Sawyer, Willard H., to Exxon Research & Engineering Co. Zirconia-containing catalysts. 4,255,288, Cl. 252-455.00Z.

Curtis, John S.: *See—*
Miller, Lee A.; and Curtis, John S., 4,255,378, Cl. 264-322.000.

Cyklop Strapping Corporation: *See—*
Fulton, Edward W.; and Pistun, Philip J., 4,254,703, Cl. 100-2.000.

Daftary, Shashikumar H., to American Cyanamid Company. Acrylic polymer composition for melt-spinning. 4,255,532, Cl. 525-59.000.

Daggerhart, James A.: *See—*
Campbell, Dudley H.; Daggerhart, James A.; and Overton, Arthur W., 4,255,635, Cl. 200-159.00A.

Dahlberg, Arthur J.: *See—*
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Daikin Kogyo Co., Ltd.: *See—*
Daimon, Shigeo; and Okamura, Kazuo, 4,255,299, Cl. 260-17.00R.

Daimon, Shigeo; and Okamura, Kazuo, to Daikin Kogyo Co., Ltd. Polymer containing perfluoroalkyl group, process for preparing the same and coating composition. 4,255,299, Cl. 260-17.00R.

Dainichi-Nippon Cables, Ltd.: *See—*
Kaide, Tamotsu; Gozen, Toshikazu; Taniguchi, Jinichi; and Ohta, Yutaka, 4,255,318, Cl. 260-42.180.

Dammann, Peter: *See—*
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Damon Corporation: *See—*
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Dana Corporation: *See—*
Hildebrand, William G.; and Tarlton, James K., 4,254,855, Cl. 192-106.200.

Danielson, Paul S.; Dumbaugh, William H., Jr.; and Hagy, Henry E., to Corning Glass Works. Glass for sealing to molybdenum metal. 4,255,198, Cl. 106-52.000.

Danner, Dean W.; and Kiel, Gary J., to GTE Automatic Electric Laboratories, Incorporated. Digital intercept recorder/announcer system. 4,255,618, Cl. 179-1.00B.

Darrah, Marion: *See—*
Burke, Oliver W., Jr.; and Hunt, Barbara P., 4,255,486, Cl. 428-356.000.

Das, Pawan K. Automated analog circuit test system. 4,255,792, Cl. 364-580.000.

Daugherty, Daniel: *See—*
Barnes, Larry A.; Daugherty, Daniel; Flynn, Michael D.; Robertson, Michael D.; and Welch, Kenneth R., 4,255,623, Cl. 179-175.20A.

Daumit, Gene P.; Buckley, Alan; and Davis, Gerald W., to Fiber Industries, Inc. Process for producing low tensile factor polyester yarn. 4,255,377, Cl. 264-176.00F.

Dauvergne, Jean L. R., to Societe Anonyme Francaise du Ferodo. Hydraulic control system for brake device. 4,254,623, Cl. 60-548.000.

Dauvergne, Jean L. R., to Societe Anonyme Francaise du Ferodo. Assisted steering device for a vehicle. 4,254,691, Cl. 91-467.000.

David & Sons, Inc.: *See—*
Ferguson, David B., 4,254,580, Cl. 47-58.000.

Davidson, James D. Die shoes with standard interchangable components and method for interchangability. 4,254,999, Cl. 308-3.00A.

Davidson, James K.: *See—*
Leliaert, Raymond M.; Lindner, Robert N.; and Davidson, James K., 4,255,169, Cl. 55-97.000.

Davies, Richard V., to Beecham Group Limited. Process for the preparation of potassium clavulanate from lithium clavulanate. 4,255,332, Cl. 260-245.300.

Davis, Austin: *See—*
Cormier, Raymond G.; Davis, Austin; Guiguizian, Jacques; Lutz, Leo O.; and Pauk, Henry T., 4,255,044, Cl. 355-15.000.

Davis, Charles W.; and Donahue, Charles J., to Stanadyne, Inc. Fuel injection pump. 4,255,097, Cl. 417-462.000.

Davis, David W.; and Helenthal, Donald F. Electrolytic cell for chlorine production. 4,255,246, Cl. 204-228.000.

Davis, Gerald W.: *See—*
Daumit, Gene P.; Buckley, Alan; and Davis, Gerald W., 4,255,377, Cl. 264-176.00F.

Davis, Henry Lincoln: *See—*
Davis, John G., 4,254,898, Cl. 222-263.000.

Davis, John G., to Davis, Owen Michael; and Davis, Henry Lincoln. Particle spacing and metering device. 4,254,898, Cl. 222-263.000.

Davis, Owen Michael: *See—*
Davis, John G., 4,254,898, Cl. 222-263.000.

Davis, William W.; and Griffith, Ernest S., to Sperry Corporation. Transmission line connector. 4,255,011, Cl. 339-177.00R.

Dawans, Francois; and Binet, Daniel, to Institut Francais du Petrole. Syntactic foam compositions useful for manufacturing floating articles. 4,255,524, Cl. 521-54.000.

Day, Janet A.; Devlin, Barry R. J.; and Searle, Robert J. G., to Shell Oil Company. Process for preparing 3-azabicyclo(3.1.0)hexane-2-carboxylic acid. 4,255,334, Cl. 260-326.50B.

Dayawon, Miguel W.: *See—*
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Dayco Corporation: *See—*
Miranti, Joseph P., Jr., 4,255,147, Cl. 474-262.000.
Standley, Paul M., 4,255,146, Cl. 474-251.000.

De La Rue Systems Limited: *See—*
Phillips, Christopher A. P., 4,255,651, Cl. 235-92.0SB.

Dea Digital Electronic Automation, S.p.A.: *See—*
Germano, Francesco; and Cavicchioli, Ugo, 4,254,554, Cl. 33-174.00L.

Deams (Proprietary) Limited: *See—*
Papsdorf, Kurt R., 4,254,617, Cl. 60-39.46G.

DeBona, Bruce T.: *See—*
Segal, Leon; and DeBona, Bruce T., 4,255,556, Cl. 528-190.000.

Decker, Thomas A.: *See—*
Kuether, Christian L.; Williams, Robert E.; Decker, Thomas A.; Kurtzman, Charles; Richardson, Kenneth T.; and Harrison, Richard A., 4,255,022, Cl. 351-24.000.

Declercq, Marc A.: *See—*
Mouille, Rene L.; Genoux, Gerard C. L.; Declercq, Marc A.; Leman, Jean-Luc M.; and Suzzi, Robert J., 4,255,084, Cl. 416-145.000.

Deere & Company: *See—*
Moore, James W., 4,254,607, Cl. 56-295.000.

Degussa Aktiengesellschaft: *See—*
Kropp, Rudolf, 4,255,191, Cl. 75-134.00N.

De Laney, Jan R. Fencing point device. 4,254,951, Cl. 273-1.00F.

Delapierre, Gilles; and Meyer, Robert, to Commissariat A. l'Energie Atomique. Method of control for an electrolytic display cell and especially a cell of the metal halide type and a circuit for the application of said method. 4,255,238, Cl. 204-18.100.

DelGrande, Donald. Mosaic structures. 4,255,475, Cl. 428-44.000.

Dellavecchia, Michael P., to Allied Chemical Corporation. Process for making composite laminated polyamide sheet material. 4,255,219, Cl. 156-243.000.

Delorme, Raymond L., to Compagnie Internationale l'Informatique-CUU Honeywell Bull. Micro-soldering tool. 4,255,644, Cl. 219-233.000.

De Luca, Peter J.: *See—*
Katcs, Michael W.; De Luca, Peter J.; and Pretorius, Peter S., 4,254,863, Cl. 206-216.000.

DelVecchio, Evo. Removable ball guide attachment for trailer hitches. 4,254,968, Cl. 280-477.000.

de Monts, Thibaut; de Varax, Herve; and Gourvenec, Jacques. Spectacles frame of wood. 4,255,024, Cl. 351-41.000.

Denki Kagaku Kogyo Kabushiki Kaisha: *See—*
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Dennis, Mahlon D.; and Gigl, Paul D., to General Electric Company. Composite compact of interleaved polycrystalline particles and cemented carbide masses. 4,255,165, Cl. 51-309.000.

Dennis, William H.: *See—*
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Densmore, Bruce D.: *See—*
Dragoy, Jens T.; and Densmore, Bruce D., 4,255,646, Cl. 219-275.000.

Denson, Jack G., Sr. Hydrodynamic gravity motor. 4,254,622, Cl. 60-496.000.

DePew, Thomas N.: *See—*
Reed, Roger D.; and Reed, Elmer E., 4,255,129, Cl. 432-13.000.

Deppe, Gary L.: *See—*
Hire, Charles J.; and Deppe, Gary L., 4,255,630, Cl. 200-81.400.

Desprez, Alfred: *See—*
Teetz, Wolfgang; and Desprez, Alfred, 4,254,721, Cl. 112-221.000.

Deuterium Corporation: *See—*
Spevack, Jerome S., 4,255,410, Cl. 423-659.000.

Deutsche Gold und Silber-Scheideanstalt Vormals Roessler: *See—*
Knorre, Helmut; Langer, Manfred; and Pohl, Gerhard, 4,255,252, Cl. 208-182.000.

Deutscher, Siegfried G.; and Grunbaum, Enrique, to Ramot University Authority for Applied Research and Industrial Development Ltd. Method of producing monocrystalline semiconductor films utilizing an intermediate water dissolvable salt layer. 4,255,208, Cl. 148-175.000.

Deutsches Krebsforschungszentrum: *See—*
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de Varax, Herve: *See—*
de Monts, Thibaut; de Varax, Herve; and Gourvenec, Jacques, 4,255,024, Cl. 351-41.000.

Devaux, Edmond-Yves, to Compagnie Generale des Etablissements Michelin. Pneumatic tires. 4,254,811, Cl. 152-209.00D.

Developak Corporation: *See—*
Evers, Jack R., 4,255,225, Cl. 156-515.000.

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Kurosawa, Takuzo; Dewa, Seiki; Kikuchi, Yuzuru; and Kanamaru, Hisanobu, 4,255,113, Cl. 425-411.000.

De Winter, Walter F.: *See—*
Laridon, Urbain L.; Marien, August M.; De Winter, Walter F.; and Kokelenberg, Hendrik E., 4,255,513, Cl. 430-281.000.

Dhein, Rolf: *See—*
Meyer, Rolf-Volker; Dhein, Rolf; Fahnler, Friedrich; Michael, Dietrich; Rudolph, Hans; and Nielinger, Werner, 4,255,560, Cl. 528-339.000.

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Dietrich, Hagen, to Norris Industries, Inc. Inner locking cylinder with captive key. 4,254,648, Cl. 70-380.000.

Dietrich, Marlene J.: *See—*
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Dietrich, Werner: *See—*
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Dietze, Wolfgang: *See—*
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Dike, John H., Jr., to Dike Equipment Corporation. Structural unit for hydraulic systems. 4,255,091, Cl. 417-63.000.

Dinbergs, Kornelius: *See—*
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Dinella, Donald; and Wong, Ching-Ping, to Western Electric Company, Inc. Mask for selectively transmitting therethrough a desired light radiant energy. 4,255,481, Cl. 428-209.000.

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Dr. Ing. hc.F. Porsche Aktiengesellschaft: *See—*
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Dodd, Joseph C. Separation drum for belt filter with suction recovery of solids. 4,255,261, Cl. 210-193.000.

Dolhyj, Serge R.: *See—*
Herrington, Daniel R.; Schwerko, Albert P.; Dolhyj, Serge R.; and Shaw, Wilfrid G., 4,255,253, Cl. 208-216.0PP.

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Domtar Inc.: *See—*
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Donahoe, John K.: *See—*
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Donahue, Charles J.: *See—*
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Donaldson, Edward: *See—*
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Donarski, William J.: *See*—
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Dornier System GmbH: *See*—
Sahm, Karl-Frieder; van Rensen, Enno; Rieger, Horst; and Jaeger, Franz, 4,255,049, Cl. 356-32.000.
Doty, Archibald C., Jr. Parallel resonant electric circuit. 4,255,728, Cl. 333-219.000.
Double E Company, Inc.: *See*—
Peterson, Bruce E., 4,254,920, Cl. 242-72.100.
Dow Chemical Company, The: *See*—
Gibbs, Dale S., 4,255,306, Cl. 260-29.60H.
Purinton, Robert J., Jr., 4,254,559, Cl. 34-9.000.
Werling, Craig L.; and Townsend, Donald I., 4,254,741, Cl. 123-1.00A.
Dow Corning Corporation: *See*—
Blizzard, John D., 4,255,316, Cl. 260-37.0SB.
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McCready, James F.; Bookwalter, John R.; Downing, Roy W.; and Guay, George W., 4,254,763, Cl. 128-20.000.
Dragerwerk Aktiengesellschaft: *See*—
Leichnitz, Kurt; and Naumann, Peter, 4,254,657, Cl. 73-421.50R.
Dragoy, Jens T.; and Densmore, Bruce D., to Sam Dick Industries, Inc. Electric liquefied petroleum gas vaporizer. 4,255,646, Cl. 219-275.000.
Drake, Charles A.; and Marwil, Stanley J., to Phillips Petroleum Company. Preparation of unsaturated nitriles. 4,255,352, Cl. 260-465.80R.
Dravnieks, Konstantins, to Wehr Corporation. Heat transfer medium for rotary heat transferrers. 4,255,171, Cl. 55-269.000.
Dravo Corporation: *See*—
Phillips, William R., Jr.; and Tate, Ronald D., 4,255,089, Cl. 417-2.000.
Dressel, Michael O., to Bendix Corporation, The. Positive release means for articulated flexible shaft. 4,254,638, Cl. 64-2.00P.
Dresser Industries, Inc.: *See*—
Blackwell, Henry W., 4,254,962, Cl. 277-181.000.
Garney, Tom A.; and Roesner, Raymond E., 4,254,830, Cl. 166-162.000.
Schpok, Ricky K.; and Martini, Leo A., 4,254,839, Cl. 175-372.000.
Drews, Ulrich: *See*—
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Drutan Products, Inc.: *See*—
Lambert, Ralph G., 4,254,530, Cl. 15-235.000.
DTPM Corporation: *See*—
Miller, Ralph, 4,255,388, Cl. 422-168.000.
Dubourg, Michel, to Framatome. Device for measuring the flow rate of cooling fluid at the inlet of the core of a water-cooled reactor. 4,255,235, Cl. 176-19.00R.
Dudrova, Eva: *See*—
Slesar, Milan; Miskovic, Vladimir; and Dudrova, Eva, 4,255,193, Cl. 75-206.000.
Dumbaugh, William H., Jr.: *See*—
Danielson, Paul S.; Dumbaugh, William H., Jr.; and Hagy, Henry E., 4,255,198, Cl. 106-52.000.
Dundon, Carl M.; and Israels, Cletus. Game timer apparatus. 4,254,955, Cl. 273-148.00R.
Dunlay, John B.: *See*—
Matsuda, Seigo; Miskolczy, Gabor; and Dunlay, John B., 4,254,821, Cl. 165-41.000.
Dunning Industries, Inc.: *See*—
Fales, Gene T.; and Mullins, James R., 4,254,866, Cl. 206-320.000.
Du Pont de Nemours, E. I., and Company: *See*—
Brasen, Wallace R., 4,255,308, Cl. 260-29.6RW.
Gosser, Lawrence W., 4,255,343, Cl. 260-385.000.
Heyer, David E., 4,255,365, Cl. 264-22.000.
Hoehn, Harvey H.; and Wells, John R., 4,255,267, Cl. 210-678.000.
Molnar, Charles J.; Price, Edward H.; and Resnick, Paul R., 4,255,240, Cl. 204-98.000.
Needes, Christopher R. S.; and Rellick, Joseph R., 4,255,291, Cl. 252-578.000.
Prichard, William W., 4,255,338, Cl. 260-346.110.
Rennolds, Philip J., 4,255,390, Cl. 422-250.000.
Simms, John A., 4,255,298, Cl. 260-17.00A.
Simms, John A., 4,255,541, Cl. 525-437.000.
Wolf, Anthony D., 4,255,353, Cl. 260-544.00C.
Durant, Graham J.: *See*—
Brown, Thomas H.; Durant, Graham J.; and Ganellin, Charon R., 4,255,428, Cl. 424-251.000.
Durbin, James. Concrete wall forming system. 4,254,932, Cl. 249-42.000.
Durkin, Joseph A., to Texaco Inc. Hydrocracking process and catalyst. 4,255,251, Cl. 208-108.000.
Durr, Siegfried: *See*—
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Dussy, Paul: *See*—
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Dutschke, Wolfgang, to Fraunhofer-Gesellschaft zur Forderung der angewandten Forschung e.V. Apparatus for testing the size and the spacings of silicon crystals in Al-Si alloys. 4,255,703, Cl. 324-71.0CP.
Dynamit Nobel Aktiengesellschaft: *See*—
Gebauer, Peter; Kaufer, Wilhelm; and Mohrke, Helmut, 4,255,462, Cl. 427-27.000.
Kuhnel, Werner; and Spielau, Paul, 4,255,372, Cl. 264-54.000.
Dynapol: *See*—
Wingard, Robert E., Jr.; and Larson, Eric R., 4,255,548, Cl. 526-310.000.
Dyneer Corporation: *See*—
St. John, Richard C., 4,254,854, Cl. 192-105.0CD.
E. J. Brooks Company: *See*—
Guiler, Richard S., 4,254,977, Cl. 292-320.000.
Eastman Kodak Company: *See*—
Audran, Roger G. L.; and Pingaud, Bernard J., 4,255,492, Cl. 428-694.000.
Giles, Ralph R.; and Weaver, Max A., 4,255,326, Cl. 260-152.000.
Harvey, Frederick W.; and Sethi, Gurdip S., 4,255,034, Cl. 354-121.000.
Howe, Dennis G., 4,255,764, Cl. 358-214.000.
Simons, Michael J.; Southby, David T.; and Ling, Hans G., 4,255,510, Cl. 430-219.000.
Van Allan, James A.; Rossi, Louis J.; Bloom, Melvin S.; Regan, Michael T.; Wright, Hal E.; and Kaukeinen, Joseph Y., 4,255,506, Cl. 430-41.000.
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Eaton Corporation: *See*—
Krieg, John J.; and Hillebrand, George A., 4,254,749, Cl. 123-502.000.
Zajac, John, 4,255,230, Cl. 156-643.000.
Ebara, Katsuya: *See*—
Ogawa, Toshio; Ebara, Katsuya; and Takahashi, Sankichi, 4,255,255, Cl. 210-652.000.
Ebener, Warren R., Jr. Viewer. 4,255,026, Cl. 353-26.00R.
Ebihara, Heihachiro, to Citizen Watch Co. Ltd. Amplitude control inverter circuit for electronic device. 4,255,723, Cl. 331-116.0FE.
Eces Co. Ltd.: *See*—
Sugimoto, Takeshige, 4,255,121, Cl. 431-208.000.
Eck, Joel D. Chemical applicator apparatus for material treatment. 4,255,112, Cl. 425-209.000.
Eckman, Raymond L.: *See*—
Leonard, Gary S.; and Eckman, Raymond L., 4,254,631, Cl. 62-117.000.
Edwards, David: *See*—
Buhler, Philip H., III, 4,255,697, Cl. 320-6.000.
Eicher, Walter: *See*—
van Mansvelt, C. Friso; Ritter, Hansruedi; and Eicher, Walter, 4,255,765, Cl. 358-225.000.
Eisele, Dieter; Pape, Jurgen; and Hochhut, Armin, to BBC Brown Boveri & Company Limited. Method for the production of a disk-shaped silicon semiconductor component with negative beveling. 4,254,590, Cl. 51-324.000.
Eisenberg, Arnold J.: *See*—
Pierce, Richard H.; and Eisenberg, Arnold J., 4,254,610, Cl. 57-22.000.
Eisenberg, Benjamin, to Ciba-Geigy AG. Removable light box. 4,255,045, Cl. 355-37.000.
El Paso Polyolefins Company: *See*—
Gardner, Harold F., 4,255,387, Cl. 422-113.000.
Eldin, Sameer H.; and Gysin, Hanspeter, to Ciba-Geigy Corporation. Storage-stable, formaldehyde-free composition for the treatment of textile material containing hydroxyl groups. 4,255,311, Cl. 260-29.6NR.
Electric Power Development Co., Inc.: *See*—
Tanaka, Minoru; and Harihara, Ryoji, 4,254,560, Cl. 34-12.000.
Electro Switch Corp.: *See*—
MacLean, Alexander, 4,255,733, Cl. 335-190.000.
Ellis, Gordon W., to Research Corporation. Edge enhancement of phase phenomena. 4,255,014, Cl. 350-13.000.
Ellsworth, Paul A.: *See*—
Spohn, Ralph J.; Ellsworth, Paul A.; and Lyford, John, IV, 4,255,279, Cl. 252-413.000.
Elovic, Ernest, to General Electric Company. Cooling air cooler for a gas turbofan engine. 4,254,618, Cl. 60-226.00R.
Elsdon, Ronald; and Stauffenberg, Dennis L., to Standard Oil Company (Indiana). Suppression of aldehyde formation in xylene. 4,255,598, Cl. 585-3.000.
Elsworth, Robert M., to Elsworth, Robert M. Apparatus for filling caulking tubes in a clean manner. 4,254,806, Cl. 141-116.000.
Elyanow, Irving D.: *See*—
Parent, Richard G.; and Elyanow, Irving D., 4,255,012, Cl. 339-242.000.
Emhart Industries, Inc.: *See*—
Braithwaite, David, 4,255,178, Cl. 65-79.000.
Fenton, Frank A., 4,255,177, Cl. 65-79.000.
Foster, Thomas V., 4,255,179, Cl. 65-79.000.
EMI Limited: *See*—
Blundell, Stephen J.; and Turner, Charles W., 4,255,660, Cl. 250-370.000.
Clow, Hugh; Walters, Peter E.; and Percival, Wiliam S., 4,254,778, Cl. 128-653.000.
Harrison, Colin G., 4,255,668, Cl. 307-107.000.
Hurst, Ivan R., 4,255,658, Cl. 250-332.000.
Emmendorfer, Charles. Fireplace heat generating system. 4,254,757, Cl. 126-121.000.
Emmerich, Hermann; and Ottmann, Rudolf, to Akzona Incorporated. Spinneret cleaning device. 4,255,109, Cl. 425-227.000.
Emmert, Richard L.: *See*—
Postupack, Dennis S.; Allerton, David A.; and Emmert, Richard L., 4,254,734, Cl. 118-624.000.

Emmons, William D.; Sperry, Peter R.; and Kaplan, Fred A., to Rohm and Haas Company. Lithographic ink of reduced volatile solvent content for reducing atmospheric pollution. 4,255,196, Cl. 106-29.000.

Endler, Wolfgang; and Zschauer, Karl-Heinz, to Siemens Aktiengesellschaft. Method for manufacturing a semiconductor structure. 4,255,206, Cl. 148-171.000.

Endo, Akira: *See*—
Oka, Hidehiko; Terahara, Akira; and Endo, Akira, 4,255,444, Cl. 424-279.000.

Endoh, Eiji: *See*—
Oda, Yoshio; Otouma, Hiroshi; and Endoh, Eiji, 4,255,247, Cl. 204-293.000.

Enga, Bernard E., to Johnson, Matthey & Co., Limited. Power sources. 4,254,739, Cl. 122-4.00D.

Engelbach, Heinz; Hoffmann, Harry; Palm, Peter; Sommer, Karl; and Sprague, Michael J., to BASF Aktiengesellschaft. Coated catalysts and their preparation. 4,255,285, Cl. 252-443.000.

Engelhard Minerals & Chemicals Corporation: *See*—
Isaac, Peter A. H., 4,254,971, Cl. 282-27.500.
Tse, Harold F., 4,255,606, Cl. 585-482.000.

Engineering Components Limited: *See*—
Taylor, Peter F., 4,254,731, Cl. 116-268.000.

Epco Mobilehome Products, Inc.: *See*—
Marshall, John J.; and Kilchenman, James M., 4,254,998, Cl. 303-20.000.

Erb, John C.: *See*—
Anderson, David M.; and Erb, John C., 4,254,701, Cl. 99-554.000.

Erikson, Robert W., to Sundstrand Corporation. Combined lift and metering pump. 4,255,093, Cl. 417-310.000.

Eriksson, Einer; Jensen, Johannes; and Lundsgaard, Jorgen S., to Innoventa ApS. Pressure control unit for the control of the pressure of at least one gas depending on the pressure of another gas. 4,254,790, Cl. 137-100.000.

Ernyei, Herbert; and Langlois, Etienne, to Societe Lignes Telegraphiques et Telephoniques. Electromechanical filters. 4,255,727, Cl. 333-197.000.

Errichiello, Dominic R. Telephone directory binders. 4,255,065, Cl. 402-75.000.

ESB Inc.: *See*—
Johnson, Robert W.; and Raddi, William J., 4,255,746, Cl. 340-577.000.

Eshelman, Cheston L. Multiple stage flexible bumper. 4,254,978, Cl. 293-137.000.

Eslava, Luis M. C.: *See*—
Peralta, Antonio L.; and Eslava, Luis M. C., 4,255,197, Cl. 106-41.000.

Ester, Lee W.: *See*—
Lambert, Daryl G.; Sage, Howard M.; and Ester, Lee W., 4,254,707, Cl. 101-123.000.

Eustance, John W.; Hobbs, Stanley Y.; and Carley, Emilie L., to General Electric Company. Textured surface polypropylene film. 4,255,381, Cl. 264-519.000.

Evans, Donald J., to Molins Machine Company, Inc. Slitter blade positioning means. 4,254,677, Cl. 83-13.000.

Evans, Frederick C. Flow augmenters for vertical-axis windmills and turbines. 4,255,085, Cl. 416-197.00A.

Evers, Jack R., to Developak Corporation. Combined heat sealer and cut-off device. 4,255,225, Cl. 156-515.000.

Ex-Cell-O Corporation: *See*—
Skrycki, Robert R., 4,254,963, Cl. 277-235.00R.

Exxon Research & Engineering Co.: *See*—
Auclair, Michel; and Le Parmentier, Louis, 4,255,125, Cl. 431-354.000.
Balinsky, George J.; Pine, Lloyd A.; and Mertzweiller, Joseph K., 4,255,289, Cl. 252-466.00B.
Bartz, Kenneth W., 4,255,533, Cl. 525-71.000.
Chandler, John E.; and Lenz, Robert W., 4,255,562, Cl. 528-397.000.
Cull, Neville L.; and Sawyer, Willard H., 4,255,288, Cl. 252-455.00Z.
Gernand, Martin O.; Mayer, Francis X.; and Siminski, Vincent, 4,255,166, Cl. 55-3.000.
Kelly, Arnold J., 4,255,777, Cl. 361-228.000.
Mayer, Francis X.; Gernand, Martin O.; and Siminski, Vincent, 4,254,557, Cl. 34-1.000.
Mayer, Francis X., 4,254,558, Cl. 34-1.000.
Mayer, Francis X.; Gernand, Martin O.; and Lincoln, William W., 4,255,403, Cl. 423-244.000.
Miller, Harold N.; Wisotsky, Max J.; and Rhodes, Richard P., 4,255,159, Cl. 44-62.000.
Moss, Gerald, 4,255,162, Cl. 48-197.00R.
Siminski, Vincent; Gernand, Martin O.; and Mayer, Francis X., 4,254,616, Cl. 60-39.120.
Spohn, Ralph J.; Ellsworth, Paul A.; and Lyford, John, IV, 4,255,279, Cl. 252-413.000.
Weiss, Robert A., 4,255,540, Cl. 525-332.000.
Wisotsky, Max J., 4,255,589, Cl. 560-198.000.

Eymery, Jean-Paul: *See*—
Rouby, Michel; and Eymery, Jean-Paul, 4,255,186, Cl. 75-122.000.

F. Jos. Lamb Company: *See*—
Koontz, Richard D., 4,254,860, Cl. 198-751.000.

Fahn, Rudolf; and Fenderl, Nikolaus, to Sud-Chemie Aktiengesellschaft. Silicatic complexing agent for alkaline earth ions and method of preparing same. 4,255,276, Cl. 252-184.000.

Fahnler, Friedrich: *See*—
Meyer, Rolf-Volker; Dhein, Rolf; Fahnler, Friedrich; Michael, Dietrich; Rudolph, Hans; and Nielinger, Werner, 4,255,560, Cl. 528-339.000.

Fahrenschon, Kurt; and Nickol, Friedrich W., to Braun Aktiengesellschaft. Display means for chronometers with electro-optical elements. 4,255,806, Cl. 368-240.000.

Fairchild Camera and Instrument Corp.: *See*—
Griffith, Paul J., 4,255,670, Cl. 307-473.000.

Falconer Plate Glass Corporation: *See*—
Workens, Frank M., 4,255,214, Cl. 148-6.14R.

Falconer, Robert A.: *See*—
Jenkins, Jerold D.; Falconer, Robert A.; and Hentz, Donald A., 4,254,565, Cl. 37-195.000.

Falconer, Roy D.: *See*—
Wilson, Robert R.; and Falconer, Roy D., 4,255,080, Cl. 415-53.00R.

Fales, Gene T.; and Mullins, James R., to Dunning Industries, Inc. Knock-down floor lamp. 4,254,866, Cl. 206-320.000.

Fariello, Ruggero G., to Wisconsin Alumni Research Foundation. Method for reducing epileptiform activity. 4,255,448, Cl. 424-315.000.

Farnworth, Wilfred: *See*—
Bleymaier, Joseph S.; Farnworth, Wilfred; and Peters, Thomas E., 4,255,108, Cl. 425-174.80E.

Faunce and Associates, Inc.: *See*—
Faust, Elbert R.; and Faunce, Stuart F., 4,255,254, Cl. 209-329.000.

Faunce, Stuart F.: *See*—
Faust, Elbert R.; and Faunce, Stuart F., 4,255,254, Cl. 209-329.000.

Faust, Elbert R.; and Faunce, Stuart F., to Faunce and Associates, Inc. Delayed counterweight vibrator apparatus. 4,255,254, Cl. 209-329.000.

Feldman, Gilbert J.; and Feldman, Richard A., to Allied Surveyor Supplies Manufacturing Co. Sectionalized driven rod. 4,254,597, Cl. 52-103.000.

Feldman, Richard A.: *See*—
Feldman, Gilbert J.; and Feldman, Richard A., 4,254,597, Cl. 52-103.000.

Fellows Corporation: *See*—
Tlaker, Erich; and Nichols, Clarence M., 4,254,690, Cl. 91-433.000.

Fenderl, Nikolaus: *See*—
Fahn, Rudolf; and Fenderl, Nikolaus, 4,255,276, Cl. 252-184.000.

Fennekels, Peter; and Schutze, Herbert, to Girmes-Werke A.G. Method of printing pile fabrics. 4,255,150, Cl. 8-471.000.

Fenster, Aaron: *See*—
Rutt, Brian K.; and Fenster, Aaron, 4,255,664, Cl. 250-445.00T.

Fenton, Frank A., to Emhart Industries, Inc. Glassware forming machines. 4,255,177, Cl. 65-79.000.

Ferguson, David B., to David & Sons, Inc. Production of sunflower seeds in increased yields. 4,254,580, Cl. 47-58.000.

Ferguson, Mike L.: *See*—
Friddell, James F.; Ford, Alves T.; and Ferguson, Mike L., 4,254,752, Cl. 123-323.000.

Ferrante, Antonio; and Thong, Yee H. Medium for the separation of human blood leucocytes. 4,255,256, Cl. 210-730.000.

Ferrero GmbH: *See*—
Lembke, Andreas; and Gorny, Dietrich, 4,255,414, Cl. 424-50.000.

Ferrie, Ronald G., to RCA Corporation. Systems for comparing and ranking a plurality of signal inputs. 4,255,740, Cl. 340-146.200.

Fersht, Rena S.; and Skinner, Winston L., to Litton Systems, Inc. Seal for fluid bearings. 4,254,961, Cl. 277-80.000.

Fetterly, Richard T.: *See*—
Anderson, Gordon H.; Nelson, David R.; and Fetterly, Richard T., 4,254,586, Cl. 51-163.100.

Fetters, Thomas T., to Continental Group, Inc., The. Apparatus for dispensing a striped product and method of producing the striped product. 4,254,894, Cl. 222-1.000.

Fiat Srl: *See*—
Cantelli, Paolo, 4,255,776, Cl. 361-213.000.

Fiber Industries, Inc.: *See*—
Daumit, Gene P.; Buckley, Alan; and Davis, Gerald W., 4,255,377, Cl. 264-176.00F.

Field, John H., II, to Sigma Instruments, Inc. Synchronous motor system. 4,255,696, Cl. 318-696.000.

Fields, Joseph E.; Asculai, Samuel S.; and Johnson, John H., to Monsanto Company. Polymeric immunoregulatory agents containing half-amide/half carboxy/imide groups. 4,255,537, Cl. 525-328.000.

Fieser, Arthur H.; and Anderson, Charles H., Jr., to A. F. Industries, Inc. Scarfing torch. 4,254,942, Cl. 266-51.000.

Filper Corporation: *See*—
Anderson, David M.; and Erb, John C., 4,254,701, Cl. 99-554.000.

Finck, Frederick P., Jr., to Highfield Mfg. Company, a Division of Clarkson Industries, Inc. Force-resistant locking devices. 4,254,647, Cl. 70-77.000.

Firmenich SA: *See*—
Giersch, Wolfgang; and Ohloff, Gunther, 4,255,292, Cl. 252-522.00R.

Fischman, Martin; Hallett, Joseph L.; and Penird, Carl W., to GTE Products Corporation. Cathode ray tube with resistor means on glass support rods. 4,255,689, Cl. 315-3.000.

Fisher, Donald W.: *See*—
Conant, Jay W.; Fisher, Donald W.; and Fox, David D., 4,255,216, Cl. 156-80.000.

Fisher, Joseph. Flexible heating elements. 4,255,649, Cl. 219-550.000.

Fisher, Philip S.: *See*—
Chevin, Sidney; and Fisher, Philip S., 4,255,047, Cl. 355-79.000.

Flagg, John F.; and Antos, George J., to UOP Inc. Nonacidic multimetallic catalytic composite. 4,255,290, Cl. 252-466.00B.

Fleming, Edward H. Domestic appliance for the liquid injection of meat. 4,254,700, Cl. 99-532.000.

Flores-Verdugo, Marco A.; Chapa-Martinez, Leobardo; and Price-Falcon, Juan F., to Hylsa, S.A. Method and apparatus for separating insufficiently cooled metal sponge particles from a mass of such particles. 4,254,876, Cl. 209-577.000.

Flynn, Michael D.: *See—*
Barnes, Larry A.; Daugherty, Daniel; Flynn, Michael D.; Robertson, Michael D.; and Welch, Kenneth R., 4,255,623, Cl. 179-175.20A.

Flynn, Richard. Device for supporting and training plants. 4,254,579, Cl. 47-46.000.

FMC Corporation: *See—*
Hensler, Paul L.; Church, Delmar F.; and Beger, Robert W., 4,255,274, Cl. 252-135.000.
Rose, Boyd W., 4,254,877, Cl. 209-594.000.

Foley, James W.: *See—*
Cincotta, Louis; and Foley, James W., 4,255,578, Cl. 546-96.000.

Foote, Allan E.; and Benzschawel, Steven J., to Container Corporation of America. Cushioning form. 4,254,870, Cl. 206-524.000.

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Friddell, James F.; Ford, Alves T.; and Ferguson, Mike L., 4,254,752, Cl. 123-323.000.

Ford, Larry C. Lysozyme assay. 4,255,517, Cl. 435-18.000.

Ford Motor Company: *See—*
Gable, Melvin G.; and Sherman, Richard H., 4,255,742, Cl. 340-347.0DD.

Forenade Fabriksverken: *See—*
Alpkvist, Jan A.; Tornkvist, Rolf G. A.; and Wurzig, Lars R., 4,255,122, Cl. 431-215.000.

Forman, Carl E.: *See—*
Coakley, Thomas A.; Rubadue, John E.; Forman, Carl E.; and Schweizer, Robert A., 4,255,317, Cl. 260-37.00N.

Forster, Siegfried; and Kleemann, Manfred, to Kernforschungsanlage Julich Gesellschaft mit beschrankter Haftung. End closure arrangement for heat exchanger element. 4,254,827, Cl. 165-166.000.

Foster, Karl: *See—*
Rauch, Gary C.; Thornburg, Donald R.; and Foster, Karl, 4,255,215, Cl. 148-31.550.

Foster, Thomas V., to Emhart Industries, Inc. Glassware forming machines. 4,255,179, Cl. 65-79.000.

Fouss, James L.; Parker, John J.; and Lytle, Donald A., to Hancor, Inc. Subterranean plastic tank. 4,254,885, Cl. 220-72.000.

Fox, David D.: *See—*
Conant, Jay W.; Fisher, Donald W.; and Fox, David D., 4,255,216, Cl. 156-80.000.

Foy, Dennis M.: *See—*
Cook, James M., III; Foy, Dennis M.; and Shuert, Lyle H., 4,254,873, Cl. 206-599.000.

Fraas, Lewis M. Multilayer photovoltaic solar cell with semiconductor layer at shorting junction interface. 4,255,211, Cl. 136-249.000.

Framatome: *See—*
Dubourg, Michel, 4,255,235, Cl. 176-19.00R.

Frame, Charles W.: *See—*
Rickrode, Jack A.; and Frame, Charles W., 4,254,663, Cl. 73-714.000.

Francis, Grosvenor F.: *See—*
Maher, Jack; and Francis, Grosvenor F., 4,254,605, Cl. 56-14.400.

Franke, John M., to United States of America, National Aeronautics and Space Administration. Direction sensitive laser velocimeter. 4,255,048, Cl. 356-28.500.

Frankland, James D., Jr., to New Castle Industries, Inc. Injection molding using screw for processing heat sensitive polymeric materials. 4,255,379, Cl. 264-328.170.

Frankovich, John H., to Atlantic Richfield Company. Process for agglomerating coal. 4,255,155, Cl. 44-1.0SR.

Franks, Neal E.; and Varga, Julianna K., to Akzona Incorporated. Composition and process for making precipitated cellulose-polyvinyl alcohol biconstituent composition. 4,255,300, Cl. 260-17.4CL.

Frantz, Jean-Marc: *See—*
Simon, Laszlo; and Frantz, Jean-Marc, 4,254,635, Cl. 62-317.000.

Franze, John P., to Armstrong Cork Company. Method of forming an embossed decorative surface covering. 4,255,217, Cl. 156-209.000.

Fratelli Borletti S.p.A.: *See—*
Broetto, Costantino, 4,255,628, Cl. 200-61.250.

Fraunhofer-Gesellschaft zur Forderung der angewandten Forschung e.V.: *See—*
Dutschke, Wolfgang, 4,255,703, Cl. 324-71.0CP.

Fredriksson, Rune O. W.: *See—*
von Matern, Sten; and Fredriksson, Rune O. W., 4,254,944, Cl. 266-275.000.

Freeman Industries, Inc.: *See—*
Freeman, Jonathan P., 4,255,242, Cl. 204-147.000.

Freeman, Jonathan P., to Freeman Industries, Inc. Reference electrode IR drop corrector for cathodic and anodic protection systems. 4,255,242, Cl. 204-147.000.

Freudenschuss, Otto, to Vockenhuber, Karl; and Hauser, Raimund. Focusing device. 4,255,029, Cl. 354-25.000.

Frey, Thomas M., to Xerox Corporation. Electronically controlled magnetic recording. 4,255,767, Cl. 358-301.000.

Friday, Philip L., to Friday Tractor Co., Inc. Tree shaking apparatus. 4,254,608, Cl. 56-328.0TS.

Friday Tractor Co., Inc.: *See—*
Friday, Philip L., 4,254,608, Cl. 56-328.0TS.

Friddell, James F.; Ford, Alves T.; and Ferguson, Mike L., to Stewart & Stevenson Services, Inc. Method of and apparatus for improving operation of a diesel engine at light loads. 4,254,752, Cl. 123-323.000.

Friedel, Rudolf, to Siemens Aktiengesellschaft. Rotating anode for x-ray tubes. 4,255,685, Cl. 313-330.000.

Friedland, Bernard, to Singer Company, The. Lock-in control system for spring suspended ring laser gyroscope. 4,255,054, Cl. 356-350.000.

Frishman, Daniel, to Akko, Inc. Display case. 4,255,001, Cl. 312-114.000.

Frito-Lay, Inc.: *See—*
Skinner, Lawrence A.; and Hilton, Barney W., 4,254,699, Cl. 99-516.000.

Frohberger, Paul-Ernst: *See—*
Kramer, Wolfgang; Buchel, Karl; Frohberger, Paul-Ernst; Brandes, Wilhelm; and Scheinpflug, Hans, 4,255,434, Cl. 424-269.000.

Frohn, Hermann-Josef. Apparatus for use in maxillary orthopaedics. 4,255,138, Cl. 433-6.000.

Frolov, Vladimir S.: *See—*
Kalinin, Viktor P.; Avdjukhin, Sergei P.; Lebedev, Vsevolod I.; Zhilin, Viktor F.; Frolov, Vladimir S.; Anisimov, Jury V.; Slavin, Jury T.; and Larionov, Valentin N., 4,255,373, Cl. 264-65.000.

Fromm, George R. Car washing aid. 4,254,526, Cl. 15-29.000.

Fuji Koki Manufacturing Oc., Ltd.: *See—*
Akio, Ohno; and Yuichi, Tamura, 4,254,634, Cl. 62-217.000.

Fuji Photo Film Co., Ltd.: *See—*
Hirano, Shigeo; Adachi, Keiichi; and Tsujino, Nobuyuki, 4,255,511, Cl. 430-217.000.
Igarashi, Akira, 4,255,491, Cl. 428-537.000.
Katoh, Kazunobu; Fujita, Saburo; Otaki, Toshihiro; and Nakashima, Shozi, 4,255,516, Cl. 430-533.000.
Kitajima, Masao; Arai, Fuminori; and Kondo, Asaji, 4,255,384, Cl. 422-57.000.
Ono, Shigetoshi; Harada, Tooru; Fujita, Shinsaku; and Yoshida, Yoshinobu, 4,255,509, Cl. 430-216.000.

Fuji Photo Optical Co., Ltd.: *See—*
Numata, Saburo, 4,255,027, Cl. 354-23.00D.

Fujieda, Toshiaki: *See—*
Ishikawa, Masami; Okano, Hirochika; Katagiri, Shigenobu; Asano, Mitsugu; and Fujieda, Toshiaki, 4,254,705, Cl. 101-93.290.

Fujihira, Masamichi: *See—*
Osa, Tetsuo; and Fujihira, Masamichi, 4,255,501, Cl. 429-111.000.

Fujii, Motoharu: *See—*
Koumura, Noboru; Komatsu, Toshiyuki; Nakagawa, Katsumi; Takekawa, Nobuhiro; and Fujii, Motoharu, 4,255,041, Cl. 355-3.00R.

Fujita, Saburo: *See—*
Katoh, Kazunobu; Fujita, Saburo; Otaki, Toshihiro; and Nakashima, Shozi, 4,255,516, Cl. 430-533.000.

Fujita, Shinsaku: *See—*
Ono, Shigetoshi; Harada, Tooru; Fujita, Shinsaku; and Yoshida, Yoshinobu, 4,255,509, Cl. 430-216.000.

Fujitsu Limited: *See—*
Ohno, Kenichi; Hosomizu, Tohru; Ogawa, Rokutaro; and Shimizu, Mitsuhisa, 4,255,672, Cl. 307-455.000.

Fukasawa, Atsushi; Ashiwa, Jun; and Sato, Takuro, to Oki Electric Industry Co., Ltd. High frequency filter. 4,255,729, Cl. 333-202.000.

Fukuda, Hiroya: *See—*
Yukuta, Toshio; Fukuda, Hiroya; and Ishii, Seiji, 4,255,526, Cl. 521-108.000.

Fukui, Isao: *See—*
Imamura, Naoki; Fukui, Isao; and Ono, Junichi, 4,255,051, Cl. 356-306.000.

Fukunaga, Yukio, to Nissan Motor Company, Limited. Electrical connector assembly. 4,255,005, Cl. 339-17.00C.

Fukutsu, Tsutomu: *See—*
Nakamura, Yoshiyuki; Matsubara, Seiichi; Matsui, Takashi; Kumagai, Taiji; Senga, Taizo; and Fukutsu, Tsutomu, 4,255,184, Cl. 75-10.00R.

Fulton, Edward W.; and Pistun, Philip J., to Cyklop Strapping Corporation. Article strapping method and apparatus. 4,254,703, Cl. 100-2.000.

Furgal, Henry P.: *See—*
Hefley, Alta J.; and Furgal, Henry P., 4,255,455, Cl. 426-42.000.

Furukawa, Yoshiyasu: *See—*
Marumoto, Ryuji; Shima, Shunsuke; and Furukawa, Yoshiyasu, 4,255,565, Cl. 536-24.000.

Furuya, Katusuke: *See—*
Watanabe, Kenkichi; and Furuya, Katusuke, 4,254,787, Cl. 133-8.00A.

Fusenig, Norbert; and Thon, Wolfgang, to Deutsches Krebsforschungszentrum. Petri dish. 4,255,522, Cl. 435-297.000.

Fuzimori, Yoshihisa: *See—*
Yamaguchi, Denjirou; Mogi, Noboru; Seta, Toshio; Oishi, Kunizo; Fuzimori, Yoshihisa; and Suzuki, Atsushi, 4,255,157, Cl. 44-3.00C.

G. D. Searle & Co.: *See—*
Sollman, Paul B., 4,255,582, Cl. 546-323.000.

G. D. Societa per Azioni: *See—*
Seragnoli, Enzo, 4,254,858, Cl. 198-347.000.

Gabbe, John D.; Judice, Charles N.; and London, Thomas B., to Bell Telephone Laboratories, Incorporated. Associative information retrieval continuously guided by search status feedback. 4,255,796, Cl. 364-900.000.

Gable, Melvin G.; and Sherman, Richard H., to Ford Motor Company. Data communication code. 4,255,742, Cl. 340-347.0DD.

Gadaev, Anatoly Y.: *See—*
Nudelman, Boris I.; Gadaev, Anatoly Y.; Bikbau, Marsel Y.; and Shishkin, Petr T., 4,255,201, Cl. 106-106.000.

Gadzhiev, Farrukh R. O.: *See—*
Aliev, Vagab S.; Aliev, Sakhib M. O.; Gadzhiev, Farrukh R. O.; Guseinov, Novruz I. O.; Mamedov, Shamkhal A. M. O.; Mardanov, Medzhid A.; Sverdlov, Rafail S.; and Khydyrov, Dzhavid N. O., 4,255,350, Cl. 260-453.00P.

GAF Corporation: *See—*
Wood, Lindley S.; Tracy, David J.; and Chakbrabarti, Paritosh M., 4,255,561, Cl. 528-388.000.

Gagliani, John, to International Harvester Company. Polyimide fibers. 4,255,488, Cl. 428-398.000.

Gaiser, Robert F., to Bendix Corporation, The. Two-stage master cylinder and valve member therefor. 4,254,624, Cl. 60-574.000.

Galimi, Giuseppe; Montalto, Mario; and Pluchino, Luciano, to Costruzioni e Impianti S.p.A. Fiat Engineering. Stacked assembly for reverse osmosis. 4,255,263, Cl. 210-321.100.

Gallacher, Lawrence V.; and Rydzik, Rachelle M., to King Industries, Inc. Solvent-extraction process for recovery and separation of metal values. 4,255,395, Cl. 423-24.000.

Ganellin, Charon R.: *See—*
Brown, Thomas H.; Durant, Graham J.; and Ganellin, Charon R., 4,255,428, Cl. 424-251.000.

Gappa, Gunther; Juntgen, Harald; Klein, Jurgen; and Schulz, Peter, to Bergwerksverband GmbH. Flow leading floor for whirl chutes. 4,255,072, Cl. 406-89.000.

Gardner, David A.; and Clark, Roger T., to Pennwalt Corporation. Catalytic process for preparing ethyl amines. 4,255,357, Cl. 564-480.000.

Gardner, Harold F., to El Paso Polyolefins Company. High pressure tubular reactor apparatus. 4,255,387, Cl. 422-113.000.

Garney, Tom A.; and Roesner, Raymond E., to Dresser Industries, Inc. Geothermal well sampler apparatus. 4,254,830, Cl. 166-162.000.

Garrett, Donald B. Portable mail delivery tray. 4,254,872, Cl. 206-561.000.

Gauer, Joseph A.; and Kennedy, William L., to Whirlpool Corporation. Automatic washer basket brake mechanism. 4,254,641, Cl. 68-23.700.

Gause, Dieter: *See—*
Wolf, Theo; Gause, Dieter; Schneider, Hans-D.; and Gunschmann, Peter, 4,254,922, Cl. 242-194.000.

Gauthier, Jean, to La Rochette-Cenpa. Cutter block for attachment to a shaft. 4,254,680, Cl. 83-665.000.

Gaylor, Ian Michael D.: *See—*
Buzzard, Michael A.; and Gaylor, Ian Michael D., 4,254,939, Cl. 254-89.00R.

Geary, David F., to Carrier Corporation. Heat reclaiming method and apparatus. 4,254,630, Cl. 62-79.000.

Gebauer, Peter; Kaufer, Wilhelm; and Mohrke, Helmut, to Dynamit Nobel Aktiengesellschaft. Method of producing polyvinylidene fluoride coatings. 4,255,462, Cl. 427-27.000.

Gebr. Hennig GmbH: *See—*
Hennig, Kurt; and Klein, Manfred, 4,254,531, Cl. 15-256.500.

Gebr. Hofmann G.m.b.H. & Co., Maschinenfabrik: *See—*
Kogler, Horst; and Goebel, Eickhart, 4,254,658, Cl. 73-462.000.

Gebruder Loepfe AG: *See—*
Mathey, Horst, 4,254,679, Cl. 83-575.000.

Geelhaar, Hans J.: *See—*
Oppenlaender, Knut; Strickler, Rainer; Geelhaar, Hans J.; Lamprecht, Josef; Penzel, Erich; and Ley, Gregor, 4,255,310, Cl. 260-29.60T.

Gehrke, Gunter: *See—*
Hederich, Volker; Gehrke, Gunter; Kuth, Robert; and Kuhnel, Werner, 4,255,151, Cl. 8-532.000.

Geier, Julius D., to Illinois Power Company. Building heating system, particularly utilizing solar and waste heat recovery. 4,254,822, Cl. 165-48.00S.

Geiger, Werner, to Inventio AG. Apparatus for manufacturing mold parts. 4,254,816, Cl. 164-173.000.

Geiger, Wilhelm; and Swozil, Adolf, to Sigri Elektrographit Gesellschaft mit beschrankter Haftung. Column seal. 4,255,363, Cl. 261-114.0TC.

Geller, William L., to GTE Laboratories Incorporated. Variable phase shift apparatus. 4,255,701, Cl. 323-217.000.

Gemmill, Robert M., Jr.: *See—*
Horodysky, Andrew G.; and Gemmill, Robert M., Jr., 4,255,271, Cl. 252-46.700.

General Dynamics/Electronics Division: *See—*
Tricoles, Gus P.; and Rope, Eugene L., 4,255,702, Cl. 324-58.00B.

General Electric Company: *See—*
Boldebuck, Edith M.; and Banucci, Eugene G., 4,255,471, Cl. 427-385.500.
Breen, Thomas B., 4,255,774, Cl. 361-95.000.
Brussen, Reinier W., 4,255,321, Cl. 260-45.75W.
Dennis, Mahlon D.; and Gigl, Paul D., 4,255,165, Cl. 51-309.000.
Elovic, Ernest, 4,254,618, Cl. 60-226.00R.
Eustance, John W.; Hobbs, Stanley Y.; and Carley, Emilie L., 4,255,381, Cl. 264-519.000.
Giffin, Rollin G., III; and Castells, Onofre T. M., 4,254,619, Cl. 60-226.00R.
Hooke, John W., 4,255,500, Cl. 429-94.000.
Liu, Ping Y., 4,255,534, Cl. 525-91.000.
Milkovic, Miran, 4,255,704, Cl. 324-127.000.
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Mischler, William R.; and General Electric Company, 4,255,684, Cl. 310-216.000.
Patterson, Franklin G., deceased, 4,255,800, Cl. 367-99.000.
Plemmons, Jerry R.; and Blake, Walter R., 4,255,781, Cl. 362-374.000.
Plunkett, Allan B.; and Turnbull, Fred G., 4,255,695, Cl. 318-723.000.
Smearing, Robert W., 4,255,277, Cl. 252-186.000.
Stokes, Vijay K., 4,254,642, Cl. 68-172.000.

General Foods Corporation: *See—*
Jasovsky, George A.; and Gottesman, Martin, 4,255,461, Cl. 426-595.000.

Genoux, Gerard C. L.: *See—*
Mouille, Rene L.; Genoux, Gerard C. L.; Declercq, Marc A.; Leman, Jean-Luc M.; and Suzzi, Robert J., 4,255,084, Cl. 416-145.000.

Georg Fischer AG: *See—*
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Georgia Tech Research Institute: *See—*
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Georgiev, Vesselin Y.; and Mednikarov, Vladimir S., to Institute Po Mechanika I Biomechanika. Retractable spray head for irrigation system. 4,254,913, Cl. 239-204.000.

Gerber, Hermann, to Sodeco-Saia AG. Miniature synchronous electric motor. 4,255,681, Cl. 310-162.000.

Germano, Francesco; and Cavicchioli, Ugo, to Dea Digital Electronic Automation, S.p.A. Connection unit for mounting a tool with precision and reliability on a machine, particularly a measuring machine. 4,254,554, Cl. 33-174.00L.

Gernand, Martin O.; Mayer, Francis X.; and Siminski, Vincent, to Exxon Research and Engineering Company. Process for the removal of particulates entrained in a fluid using a magnetically stabilized fluid cross-flow contactor. 4,255,166, Cl. 55-3.000.

Gernand, Martin O.: *See—*
Mayer, Francis X.; Gernand, Martin O.; and Siminski, Vincent, 4,254,557, Cl. 34-1.000.
Mayer, Francis X.; Gernand, Martin O.; and Lincoln, William W., 4,255,403, Cl. 423-244.000.
Siminski, Vincent; Gernand, Martin O.; and Mayer, Francis X., 4,254,616, Cl. 60-39.120.

Gerthoffer, Bernard P.; and Kolwaite, John S. Quick-acting closure unit. 4,254,801, Cl. 138-89.000.

Gervase Instruments Limited: *See—*
Graham, Ian G., 4,254,664, Cl. 73-861.580.

GF Business Equipment, Inc.: *See—*
Textoris, Melvin A., 4,255,610, Cl. 174-48.000.

Giacino, Christopher: *See—*
Withycombe, Donald A.; Mookherjee, Braja D.; Mussinan, Cynthia J.; Vock, Manfred H.; and Giacino, Christopher, 4,255,583, Cl. 548-146.000.

Gibbs, Dale S., to Dow Chemical Company, The. Vinylidene chloride polymer microgels. 4,255,306, Cl. 260-29.60H.

Gibilisco, John M.: *See—*
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Gibson, Larry N. Collapsable snow sled. 4,254,964, Cl. 280-20.000.

Giersch, Wolfgang; and Ohloff, Gunther, to Firmenich SA. Perfuming composition containing 3-phenyl-cyclohex-2-en-1-one. 4,255,292, Cl. 252-522.00R.

Giffin, Rollin G., III; and Castells, Onofre T. M., to General Electric Company. Partial span inlet guide vane for cross-connected engines. 4,254,619, Cl. 60-226.00R.

Gigl, Paul D.: *See—*
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Giles, Ralph R.; and Weaver, Max A., to Eastman Kodak Company. Nitrogen and/or sulfur containing heterocyclic azo dyes with aniline, tetrahydroquinoline and benzomorpholine couplers having sulfate group. 4,255,326, Cl. 260-152.000.

Gilles, Pierre: *See—*
Moreaud, Henri; Gilles, Pierre; and Leglise, Jean-Paul, 4,255,266, Cl. 210-614.000.

Gillespie, Sally I. Skin firming composition and method. 4,255,416, Cl. 424-80.000.

Giorgini, Norman L.; and Ulseth, John W., to Minnesota Mining and Manufacturing Company. Mechanical counter. 4,255,650, Cl. 235-91.00R.

Girault, Jean-Pierre Y. B.: *See—*
Andre, Pierre A.; Thevenin, Jean-Claude P. H. P.; Girault, Jean-Pierre Y. B.; and Richter, Gerhard, 4,255,083, Cl. 415-119.000.

Girmes-Werke A.G.: *See—*
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Givaudan Corporation: *See—*
Kaiser, Roman; and Lamparsky, Dietmar, 4,255,337, Cl. 260-346.110.

Glen, Donald H. G. Blanching, pasteurizing and sterilizing process and apparatus suitable therefor. 4,255,459, Cl. 426-521.000.

Gliniorz, Lothar: *See—*
Schoettle, Klaus; Muenzner, Wulf; Lechner, Hilmar; Woeppel, Dieter; and Gliniorz, Lothar, 4,254,585, Cl. 51-5.00A.

Godecke Aktiengesellschaft: *See—*
Herrmann, Wolfgang; Satzinger, Gerhard; Herrmann, Manfred; Steinbrecher, Wolfgang; and Bahrmann, Heinrich, 4,255,433, Cl. 424-267.000.

Godefroy, Andre M.: *See—*
Cretin, Bertrand; and Godefroy, Andre M., 4,254,513, Cl. 4-231.000.

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Kogler, Horst; and Goebel, Eickhart, 4,254,658, Cl. 73-462.000.

Goebel, Konrad, to Kraftwerk Union Aktiengesellschaft. Aspirating system for the compressor of a gas turbine. 4,255,082, Cl. 415-182.000.

Goettl, Adam D. Automatic flushing and draining reservoir apparatus for evaporative coolers. 4,255,361, Cl. 261-27.000.

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Plath, Peter; Rohr, Wolfgang; and Goetz, Norbert, 4,255,587, Cl. 560-43.000.

Goodman, Robert M., Jr., to Georgia Tech Research Institute. Feed mechanism for a geodesic lens. 4,255,751, Cl. 343-754.000.

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Hurlock, John R.; and Goretta, Louis A., 4,255,545, Cl. 526-201.000.

Gorny, Dietrich: *See*—
Lembke, Andreas; and Gorny, Dietrich, 4,255,414, Cl. 424-50.000.

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Gottesman, Martin: *See*—
Jasovsky, George A.; and Gottesman, Martin, 4,255,461, Cl. 426-595.000.

Gould, Arnold S. Illuminated flying saucer-like toys. 4,254,575, Cl. 46-74.00D.

Gould, Francis E., to Tyndale Plains - Hunter Ltd. Polyurethane polymers characterized by carboxylate groups and hydroxyl groups in the polymer backbone. 4,255,550, Cl. 528-44.000.

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Smith, Robert K., 4,255,631, Cl. 200-147.00R.

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de Monts, Thibaut; de Varax, Herve; and Gourvenec, Jacques, 4,255,024, Cl. 351-41.000.

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Gr/bein, Wolfgang: *See*—
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Graham, Donald H. Method and apparatus for preparing organic waste fuels. 4,254,716, Cl. 110-346.000.

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Graham Magnetics Incorporated: *See*—
Cosby, Phillip A., 4,255,807, Cl. 371-21.000.

Granda, Edward J.: *See*—
Mussinan, Cynthia J.; Mookherjee, Braja D.; Vock, Manfred H.; Schmitt, Frederick L.; Shuster, Edward J.; Sanders, James M.; Light, Bette M.; and Granda, Edward J., 4,255,460, Cl. 426-538.000.

Granzow, Albrecht H.; and Savides, Christos, to American Cyanamid Company. Synergistic flame retardant compositions for polyphenylene ether resins. 4,255,324, Cl. 260-45.85T.

Gras, Rainer: *See*—
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Grasselli, Robert K.: *See*—
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Grefco, Inc.: *See*—
Nielsen, Richard B., 4,255,489, Cl. 428-405.000.

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Gresch, Heinz: *See*—
Holter, Heinz; Gresch, Heinz; and Igelbuscher, Heinrich, 4,255,195, Cl. 106-18.120.

Greuter, Hans: *See*—
Martin, Pierre; Greuter, Hans; and Bellus, Daniel, 4,255,351, Cl. 260-456.00R.

Greutert, Albert, to Maxs AG. Reusable coffee filter. 4,255,265, Cl. 210-474.000.

Griffith, Ernest S.: *See*—
Davis, William W.; and Griffith, Ernest S., 4,255,011, Cl. 339-177.00R.

Griffith, Paul J., to Fairchild Camera and Instrument Corp. Transistor logic tristate output with feedback. 4,255,670, Cl. 307-473.000.

Grill, Michael; and Grohmann, Helmut, to Veitscher Magnesitwerke-Actien-Gesellschaft. Process for the recovery of magnesium oxide of high purity. 4,255,399, Cl. 423-164.000.

Grim, George B., to Caterpillar Tractor Co. Apparatus for preheating a rotatable fluidizable bed. 4,255,135, Cl. 432-107.000.

Grimminger, Albert; Strecker, Jurgen; Wiedmann, Werner; and Wenning, Peter, to Werner & Pfleiderer; and Veba Oel AG. Apparatus for introducing solid fuels into a pressure gasification reactor. 4,255,161, Cl. 48-86.00R.

Grinwis, Jack M.: *See*—
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Grisar, J. Martin; and Claxton, George P., to Richardson-Merrell Inc. 2-Hydroxy-5-(1-hydroxy-2-piperazinylethyl)-benzoic acid derivatives. 4,255,575, Cl. 544-394.000.

Grober, Josef: *See*—
Wackerle, Peter M.; Brunsch, Klaus; and Grober, Josef, 4,255,087, Cl. 416-230.000.

Grogler, Gerhard; and Meyborg, Holger, to Bayer Aktiengesellschaft. Polyisocyanate reaction products of diisocyanates and s-triazine derivatives containing amino groups. 4,255,570, Cl. 544-197.000.

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Groupements d'Interets Economiques Europe-Levage-Manutention (ELMA): *See*—
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Gruber, Helmut; and Reinhard, Kurt, to BBC Brown Boveri & Company Limited. Steam turbine plant. 4,254,627, Cl. 60-646.000.

Grunbaum, Enrique: *See*—
Deutscher, Siegfried G.; and Grunbaum, Enrique, 4,255,208, Cl. 148-175.000.

Grundfest, Michael A., to Thomas & Betts Corporation. Insulator for covering electric cables. 4,255,612, Cl. 174-88.00R.

Grunza, Gene; and Herscher, Marvin B., to Threshold Technology, Inc. Receiving apparatus having a plurality of antennas. 4,255,816, Cl. 455-277.000.

Grupp, Bernhard: *See*—
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GTE Automatic Electric Laboratories, Incorporated: *See*—
Danner, Dean W.; and Kiel, Gary J., 4,255,618, Cl. 179-1.00B.
Marheine, Edward A., 4,255,621, Cl. 179-27.0CA.
Vonder, David L., 4,255,634, Cl. 200-153.0LA.
Walton, Richard A.; and Mocko, John, Jr., 4,255,624, Cl. 179-175.20D.
Walton, Richard A.; and Mocko, John, Jr., 4,255,625, Cl. 179-175.20D.

GTE Laboratories Incorporated: *See*—
Cooperman, Michael, 4,255,715, Cl. 330-9.000.
Geller, William L., 4,255,701, Cl. 323-217.000.
Naugle, Richard L., 4,255,669, Cl. 307-131.000.

GTE Products Corporation: *See*—
Fischman, Martin; Hallett, Joseph L.; and Penird, Carl W., 4,255,689, Cl. 315-3.000.
Kim, Tai K., 4,255,396, Cl. 423-54.000.
Martin, Brice E.; Ritsko, Joseph E.; and Acla, Howard L., 4,255,397, Cl. 423-61.000.

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Watts, Roger E.; Wright, William W.; and Donarski, William J., 4,255,626, Cl. 200-6.00A.

Guay, George W.: *See*—
McCready, James F.; Bookwalter, John R.; Downing, Roy W.; and Guay, George W., 4,254,763, Cl. 128-20.000.

Guay, Paul J., to United States of America, Interior. Link-loc chainless haulage system. 4,254,710, Cl. 104-165.000.

Guberman, Robert P.: *See*—
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Guenin, Albert, to Contraves AG. Method for digital interpolation of a period of a three-phase analog signal. 4,255,743, Cl. 340-347.0SY.

Guenther, Lloyd M., to Chevron Research Company. Apparatus for splicing thermoplastic yarns. 4,255,222, Cl. 156-433.000.

Guiguizian, Jacques: *See*—
Cormier, Raymond G.; Davis, Austin; Guiguizian, Jacques; Lutz, Leo O.; and Pauk, Henry T., 4,255,044, Cl. 355-15.000.

Guiler, Richard S., to E. J. Brooks Company. Security seal of the padlock type with tamper indicating protrusions. 4,254,977, Cl. 292-320.000.

Guillory, Melvin J., Jr.: *See*—
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Gulf Oil Corporation: *See*—
Antonoplos, Patricia A.; and Heilman, William J., 4,255,313, Cl. 260-30.200.
Hillman, Melville E. D., 4,255,588, Cl. 560-127.000.

Gulf Research & Development Company: *See*—
Carr, Norman L.; and McGinnis, Edgar L., 4,255,258, Cl. 210-727.000.
Wu, Ching-Yong; Kobylinski, Thaddeus P.; and Bozik, John E., 4,255,596, Cl. 568-860.000.
Wu, Ching-Yong; Kobylinski, Thaddeus P.; and Bozik, John E., 4,255,599, Cl. 585-319.000.

Gunjima, Tomoki: *See*—
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Gunschmann, Peter: *See*—
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Gupta, Santosh: *See*—
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Guse, Kuno; and Schmitjans, Josef, to Bochumer Eisenhutte Heintzmann GmbH & Co. Process of and an arrangement for mining. 4,254,995, Cl. 299-17.000.

Guseinov, Novruz I. O.: *See*—
Aliev, Vagab S.; Aliev, Sakhib M. O.; Gadzhiev, Farrukh R. O.; Guseinov, Novruz I. O.; Mamedov, Shamkhal A. M. O.; Mardanov, Medzhid A.; Sverdlov, Rafail S.; and Khydyrov, Dzhavid N. O., 4,255,350, Cl. 260-453.00P.

Guyer, Nathan E., to American Biltrite, Inc. Portable end heater for plastic hose. 4,255,137, Cl. 432-225.000.
Gysin, Hanspeter: *See—*
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H. B. Fuller Company: *See—*
Olson, Beverly J. E., 4,255,468, Cl. 427-137.000.
H. R. Electronics Company: *See—*
Levasseur, Joseph L.; Seiter, William A.; and Christensen, Calvin J., 4,254,857, Cl. 194-100.00A.
Hackmack, Klaus-Georg: *See—*
Thiele, Willi; Hackmack, Klaus-Georg; and Hohm, Reinhard, 4,254,781, Cl. 131-111.000.
Haehn, James B.: *See—*
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Haemers, Guy, to N. V. Bekaert S.A. Steel wire reinforcing elements with a brass-cobalt alloy adhesive coating. 4,255,496, Cl. 428-677.000.
Hafer, Ronald L.: *See—*
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Hag Aktiengesellschaft: *See—*
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Hagen, Kenneth G.: *See—*
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Hager, Clarence H., to Modern Suspension Systems, Inc. Caster apparatus. 4,254,532, Cl. 16-20.000.
Hager, Walter; and Walther, Karl-Heinz, to Pfaff Industriemaschinen GmbH. Thread-cutting device for sewing machines having a revolving looper. 4,254,725, Cl. 112-292.000.
Hague International: *See—*
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Hait, James M. Self-propelled irrigation system. 4,254,911, Cl. 239-177.000.
Hakala, David F., to RCA Corporation. Method for producing CRT screen structure. 4,255,504, Cl. 430-28.000.
Halff, Albert H.: *See—*
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Hall, John B.: *See—*
Sprecker, Mark A.; Hall, John B.; and Schmitt, Frederick L., 4,255,275, Cl. 252-174.110.
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Hamabata, Toshihiro; and Umeki, Shinji, to TDK Electronics Company Limited. Process for producing acicular goethite. 4,255,409, Cl. 423-632.000.
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Hammond, Earl: *See—*
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Hammond, Karl; and Hammond, Earl. Combination drip edge member and rake. 4,254,594, Cl. 52-11.000.
Han, Joon H.; and Cho, Tae H. Electrically powered vehicle. 4,254,843, Cl. 180-165.000.
Hanabe, Kenichi: *See—*
Matsuda, Hideo; Yuki, Kiyohiro; Kawade, Takashi; Adachi, Takaaki; and Hanabe, Kenichi, 4,255,766, Cl. 358-257.000.
Hanada, Hiroshi; Kitajima, Nobuo; and Masaki, Tatsuo, to Canon Kabushiki Kaisha. Electrophotographic process using layered element containing p-type or n-type materials, with multiple charging steps and blanket irradiation. 4,255,505, Cl. 430-31.000.
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Hanfeld, Franzhermann. Tree stand. 4,254,578, Cl. 47-40.500.
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Hard, Alfred B. Overhead kitchen utensil rack. 4,254,881, Cl. 211-71.000.
Hardinge Brothers, Inc.: *See—*
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Hardman, Harley F., to Standard Oil Company (Ohio). Dehydrogenation catalyst. 4,255,284, Cl. 252-437.000.
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Harms, Wolfgang; Wunderlich, Klaus; and van Oertzen, Klaus, to Bayer Aktiengesellschaft. Reactive dyestuffs. 4,255,325, Cl. 260-146.00T.
Harrington, Colin J.; and Askew, Herbert F., to Castrol Limited. Boron-silicon compounds suitable for use as hydraulic fluids. 4,255,586, Cl. 556-402.000.
Harris, Allen E., to Halliburton Company. Retriever tool. 4,254,983, Cl. 294-86.210.
Harris Corporation: *See—*
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Morcom, William R., 4,255,229, Cl. 156-628.000.
Nicolay, Hugh C.; and Lucas, William G., 4,255,207, Cl. 148-174.000.
Harris, Richard W.; Cleveland, John F.; and Lott, Thomas M., to VBC, Inc. Method and apparatus for bandwidth reduction. 4,255,620, Cl. 179-15.55R.
Harrison, Colin G., to EMI Limited. Pulsed power supplies. 4,255,668, Cl. 307-107.000.
Harrison, Richard A.: *See—*
Kuether, Christian L.; Williams, Robert E.; Decker, Thomas A.; Kurtzman, Charles; Richardson, Kenneth T.; and Harrison, Richard A., 4,255,022, Cl. 351-24.000.
Harry, Dennis W.: *See—*
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Hartford, Thomas W.; Johnson, Edwin A.; and Russo, Frank A., to Bendix Corporation, The. Microprocessor-based electronic engine control system. 4,255,789, Cl. 364-431.000.
Harvey, Frederick W.; and Sethi, Gurdip S., to Eastman Kodak Company. Film retention in cartridge assembly. 4,255,034, Cl. 354-121.000.
Hasebe, Nobuyasu, to New World Business Corporation. Process for oxidizing oxides of sulfur. 4,255,400, Cl. 423-235.000.
Hasegawa, Akira, to Bell Telephone Laboratories, Incorporated. Tunable source of coherent electromagnetic radiation based on modulational instability. 4,255,017, Cl. 350-96.290.
Hashizume, Genzo: *See—*
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Havira, R. Mark, to Schlumberger Technology Corp. Method and apparatus for acoustically investigating a casing and cement bond in a borehole. 4,255,798, Cl. 367-35.000.
Hayashi, Mamoru: *See—*
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Hayes, Thomas E., to Johnson Controls, Inc. Thermostat with simulated heat anticipation. 4,254,906, Cl. 236-78.00D.
Heap, James C., to Thrall Car Manufacturing Company. Dual bottom trough gondola railway car. 4,254,714, Cl. 105-406.00R.
Hechtenberg, Kurt-Volker, to Messerschmitt-Bolkow-Blohm GmbH. Programmable binary correlator. 4,255,795, Cl. 364-728.000.
Hederich, Volker; Gehrke, Gunter; Kuth, Robert; and Kuhnel, Werner, to Bayer Aktiengesellschaft. Process for dyeing and printing cellulose fibres. 4,255,151, Cl. 8-532.000.
Hedstrom Co.: *See—*
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Hefley, Alta J.; and Furgal, Henry P., to Miles Laboratories, Inc. Preparation of casein with lowered cholesterol content. 4,255,455, Cl. 426-42.000.
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Helgorsky, Jacques; and Leveque, Alain, to Rhone-Poulenc Industries. Process for the separating of rare earths. 4,255,394, Cl. 423-21.500.

Hellsten, Karl M. E.: *See—*
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Helpinstill, Charles T., III. Breakdown piano. 4,254,684, Cl. 84-176.000.

Helwig, William F., Jr., to Avtec Industries, Inc. Energy saving dishwasher. 4,254,788, Cl. 134-57.00D.

Hendrischk, Wolfgang, to Mannesmann Aktiengesellschaft. Matrix print head. 4,255,062, Cl. 400-124.000.

Henke, Ronald E.: *See—*
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Henkel Corporation: *See—*
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Hennig, Kurt; and Klein, Manfred, to Gebr. Hennig GmbH. Stripping device. 4,254,531, Cl. 15-256.500.

Henriksson, Kerstin E.: *See—*
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Henry, Gary G. Apparatus for converting code signal to visual display. 4,255,749, Cl. 340-706.000.

Hensler, Paul L.; Church, Delmar F.; and Beger, Robert W., to FMC Corporation. Preparation of granular sodium tripolyphosphate products. 4,255,274, Cl. 252-135.000.

Hensley, Michael J.: *See—*
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Hentz, Donald A.: *See—*
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Heraeus Christ GmbH: *See—*
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Herbst, Richard L., to Quanta-Ray, Inc. Transversely pumped dye laser having improved conversion efficiency. 4,255,718, Cl. 331-94.50L.

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Herdle, William B.; and Kanner, Bernard, to Union Carbide Corporation. Preparation of dimethylaminosilanes. 4,255,348, Cl. 556-410.000.

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Herman Miller, Inc.: *See—*
Propst, Robert L.; and Wodka, Michael A., 4,255,611, Cl. 174-48.000.

Herring, William T. Slotted floor section with built-in means adapted for heating weaned pigs in nursery. 4,254,737, Cl. 119-28.000.

Herrington, Daniel R.; Schwerko, Albert P.; Dolhyj, Serge R.; and Shaw, Wilfrid G., to Standard Oil Company, The. Hydrogen processing of hydrocarbon feeds using coated catalysts. 4,255,253, Cl. 208-216.0PP.

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Grunza, Gene; and Herscher, Marvin B., 4,255,816, Cl. 455-277.000.

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Hess, Peter, to Metallwerk Max Brose GmbH. Operating mechanism for a motorcar window. 4,254,584, Cl. 49-325.000.

Hestair Bettinson Limited: *See—*
Stocks, Richard A., 4,254,897, Cl. 222-159.000.

Hetzel, Henry T.: *See—*
Carau, Frank P., Sr.; Hetzel, Henry T.; and Tremblay, Michael A., 4,255,617, Cl. 178-19.000.

Hewitt, Brian; Hobday, Cyril; Jack, James; and Keenan, John F. E., to Ciba-Geigy Corporation. Process for the dyeing of hydrophobic fibres. 4,255,152, Cl. 8-583.000.

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Carau, Frank P., Sr.; Hetzel, Henry T.; and Tremblay, Michael A., 4,255,617, Cl. 178-19.000.
Clouser, David E.; and Craven, John S., 4,254,654, Cl. 73-27.00R.

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Heyer-Schulte Corporation: *See—*
Chase, Charles P.; and Link, William J., 4,254,511, Cl. 3-13.000.

Hi Shear Corporation: *See—*
Schuster, Michael M., 4,254,809, Cl. 411-167.000.

Hi-Stat Manufacturing Company, Inc.: *See—*
Hire, Charles J.; and Deppe, Gary L., 4,255,630, Cl. 200-81.400.

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Setoguchi, Takanoru; and Hidaka, Yoshiaki, 4,254,851, Cl. 191-31.000.

Higgins, Eldon C., to Kidde, Inc. Manufacture of doors for safe deposit box nests. 4,254,545, Cl. 29-558.000.

Highfield Mfg. Company, a Division of Clarkson Industries, Inc.: *See—*
Finck, Frederick P., Jr., 4,254,647, Cl. 70-77.000.

Hikin, Boris L., to International Rectifier Corporation. High reverse voltage semiconductor device with fast recovery time with central depression. 4,255,757, Cl. 357-58.000.

Hildebrand, William G.; and Tarlton, James K., to Dana Corporation. Coaxial spring damper drive. 4,254,855, Cl. 192-106.200.

Hill, Philip R., to Chromatex, Inc. Apparatus for forming laminated fabrics. 4,255,227, Cl. 156-555.000.

Hillebrand, George A.: *See—*
Krieg, John J.; and Hillebrand, George A., 4,254,749, Cl. 123-502.000.

Hillman, Dale A. Dual redundant error detection system for counters. 4,255,809, Cl. 371-58.000.

Hillman, Melville E. D., to Gulf Oil Corporation. Synthesis of cyclohexene dicarboxylic acid esters. 4,255,588, Cl. 560-127.000.

Hilton, Barney W.: *See—*
Skinner, Lawrence A.; and Hilton, Barney W., 4,254,699, Cl. 99-516.000.

Hirai, Tadaaki: *See—*
Maruyama, Eiichi; Imamura, Yoshinori; Ataka, Saburo; Inao, Kiyohisa; Takasaki, Yukio; Tsukada, Toshihisa; and Hirai, Tadaaki, 4,255,686, Cl. 313-366.000.

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Hirata, Kiminori: *See—*
Ozawa, Kiyomi; Ishii, Shigeru; Hayashi, Mamoru; Hirose, Masayoshi; and Hirata, Kiminori, 4,255,447, Cl. 424-304.000.

Hire, Charles J.; and Deppe, Gary L., to Hi-Stat Manufacturing Company, Inc. Multi-circuit electrical switch. 4,255,630, Cl. 200-81.400.

Hirohara, Hideo; Nabeshima, Shigeyasu; Mitsuda, Satoshi; and Nagase, Tsuneyuki, to Sumitomo Chemical Company, Limited. Method for isolation of glucose isomerase. 4,255,521, Cl. 435-234.000.

Hirose, Masayoshi: *See—*
Ozawa, Kiyomi; Ishii, Shigeru; Hayashi, Mamoru; Hirose, Masayoshi; and Hirata, Kiminori, 4,255,447, Cl. 424-304.000.

Hitachi Koki Company Limited: *See—*
Ishikawa, Masami; Okano, Hirochika; Katagiri, Shigenobu; Asano, Mitsugu; and Fujieda, Toshiaki, 4,254,705, Cl. 101-93.290.

Hitachi, Ltd.: *See—*
Arakawa, Hideo; Kuniya, Keiichi; and Ohashi, Masabumi, 4,254,548, Cl. 29-879.000.
Imazu, Syuichi, 4,254,825, Cl. 165-114.000.
Kinoshita, Yasuaki; and Tabuchi, Toyoji, 4,255,726, Cl. 333-195.000.
Kurosawa, Takuzo; Dewa, Seiki; Kikuchi, Yuzuru; and Kanamaru, Hisanobu, 4,255,113, Cl. 425-411.000.
Maruyama, Eiichi; Imamura, Yoshinori; Ataka, Saburo; Inao, Kiyohisa; Takasaki, Yukio; Tsukada, Toshihisa; and Hirai, Tadaaki, 4,255,686, Cl. 313-366.000.
Ogawa, Toshio; Ebara, Katsuya; and Takahashi, Sankichi, 4,255,255, Cl. 210-652.000.
Sekine, Kenji; and Kaneko, Yoichi, 4,255,730, Cl. 333-247.000.
Takeyasu, Kiyoo; Kato, Kanji; Goto, Tatsuo; Oouchi, Yoozoo; Yoshida, Kazuhiro; Ito, Yoshitoshi; and Takami, Katsumi, 4,255,762, Cl. 358-100.000.
Tanifuji, Shinya; and Morooka, Yasuo, 4,255,133, Cl. 432-24.000.

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Kuroda, Masao; Ono, Sekijyuro; Katakura, Kageyoshi; and Kondo, Toshio, 4,254,662, Cl. 73-626.000.

Hitachi Plant Engineering and Construction Co., Ltd.: *See—*
Ogawa, Toshio; Ebara, Katsuya; and Takahashi, Sankichi, 4,255,255, Cl. 210-652.000.

Hobbs, Stanley Y.: *See—*
Eustance, John W.; Hobbs, Stanley Y.; and Carley, Emilie L., 4,255,381, Cl. 264-519.000.

Hobday, Cyril: *See—*
Hewitt, Brian; Hobday, Cyril; Jack, James; and Keenan, John F. E., 4,255,152, Cl. 8-583.000.

Hochhut, Armin: *See—*
Eisele, Dieter; Pape, Jurgen; and Hochhut, Armin, 4,254,590, Cl. 51-324.000.

Hochstrate, Paul E., to Timex Corporation. Voltage controlled multivibrator having variable frequency and duty cycle. 4,255,722, Cl. 331-113.00R.

Hodge, Philip E.: *See—*
Levine, Stanley R.; Miller, Robert A.; and Hodge, Philip E., 4,255,495, Cl. 428-632.000.

Hoechst Aktiengesellschaft: *See—*
Greiner, Gunther; Gr/bein, Wolfgang; and Albrecht, Erhard, 4,255,257, Cl. 210-709.000.
Muller, Werner H., 4,255,571, Cl. 544-239.000.
Werner, Gerhard; Schmelzer, Heinz; and Sattelmeyer, Richard, 4,255,297, Cl. 260-5.000.

Hoechst-Roussel Pharmaceuticals Inc.: *See*—
Urban, Joseph J., 4,254,883, Cl. 215-32.000.

Hoefke, Wolfgang: *See*—
Koppe, Herbert; Mentrup, Anton; Renth, Ernst-Otto; Schromm, Kurt; Hoefke, Wolfgang; and Muacevic, Gojko, 4,255,430, Cl. 424-258.000.

Hoefs, Rainer: *See*—
Buhren, Wolfgang; Hoefs, Rainer; and Bez, Ulrich, 4,254,518, Cl. 5-450.000.

Hoehn, Harvey H.; and Wells, John R., to Du Pont de Nemours, E. I., and Company. Separation and recovery of granulocytes from blood using adherence on an expandable bed of a polymeric material. 4,255,267, Cl. 210-678.000.

Hoffman-La Roche Inc.: *See*—
Hoffmann-Paquotte, Hans, 4,255,584, Cl. 548-236.000.

Hoffman, Richard E.: *See*—
Adams, Leo G.; and Hoffman, Richard E., 4,255,302, Cl. 260-18.0EP.

Hoffmann, Arthur G.; Guberman, Robert P.; and Horner, Larry E., to Westinghouse Electric Corp. System and method for controlling the power generated by a system of hydro-plants and thermal units. 4,255,787, Cl. 364-494.000.

Hoffmann, Erwin; Dietrich, Werner; and Kraft, Karl J., to Bayer Aktiengesellschaft. Equipment for the continuous production of foam boards. 4,255,105, Cl. 425-144.000.

Hoffmann, Harry: *See*—
Engelbach, Heinz; Hoffmann, Harry; Palm, Peter; Sommer, Karl; and Sprague, Michael J., 4,255,285, Cl. 252-443.000.

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Rosen, Perry, 4,255,574, Cl. 544-323.000.
Winternitz, Paul, 4,255,436, Cl. 424-270.000.

Hoffmann-Paquotte, Hans, to Hoffman-La Roche Inc. Method for preparing 5-cyano-4-methyl-oxazole. 4,255,584, Cl. 548-236.000.

Hoffrichter, Ingo: *See*—
Knop, Hans-Georg; and Hoffrichter, Ingo, 4,255,761, Cl. 358-80.000.

Hohlein, Peter; and Schoeps, Jochen, to Bayer Aktiengesellschaft. Cross-linkable lacquer binder containing saturated lactam. 4,255,530, Cl. 525-6.000.

Hohm, Reinhard: *See*—
Thiele, Willi; Hackmack, Klaus-Georg; and Hohm, Reinhard, 4,254,781, Cl. 131-111.000.

Hokko Chemical Industry Co., Ltd.: *See*—
Ohyama, Hiroshi; Takada, Sanae; Watanabe, Yoshihisa; Tamura, Jyotaroh; and Taketomi, Iwao, 4,255,183, Cl. 71-120.000.

Hold, Peter; Tadmor, Zehev; and Valsamis, Lefteris N., to USM Corporation. Processing element. 4,255,059, Cl. 366-97.000.

Holman, John A. Artificial board of lumber. 4,255,477, Cl. 428-106.000.

Holowaty, Michael O.: *See*—
Bhattacharya, Debanshu; Quinto, Dennis T.; and Holowaty, Michael O., 4,255,187, Cl. 75-123.0AA.

Holstein & Kappert GmbH: *See*—
Schadel, Hermann, 4,254,792, Cl. 137-240.000.

Holter, Heinz; Gresch, Heinz; and Igelbuscher, Heinrich. Compositions containing silicon dioxide. 4,255,195, Cl. 106-18.120.

Holtey, Thomas O.; and Yu, Kin C., to Honeywell Information Systems Inc. Multi-way vectored interrupt capability. 4,255,786, Cl. 364-200.000.

Holzapfel, Gunter: *See*—
Rickert, Hans; and Holzapfel, Gunter, 4,255,647, Cl. 219-322.000.

Hombach, Rudolf: *See*—
Muller, Hans-Jurgen; Hombach, Rudolf; Dollhausen, Manfred; and Zirner, Joachim, 4,255,569, Cl. 544-193.000.

Honda Giken Kogyo Kabushiki Kaisha: *See*—
Chiba, Shoichi; Konuma, Kunio; and Ishizaki, Hirofumi, 4,254,746, Cl. 123-52.00M.

Hondeghem, Luc M. Programmable pulse generating system. 4,255,790, Cl. 364-487.000.

Honeywell Information Systems Inc.: *See*—
Holtey, Thomas O.; and Yu, Kin C., 4,255,786, Cl. 364-200.000.

Hoogovens IJmuiden BV: *See*—
Soepenberg, Everhardus N., 4,255,239, Cl. 204-28.000.

Hooke, John W., to General Electric Company. Vibration resistant electrochemical cell having deformed casing and method of making same. 4,255,500, Cl. 429-94.000.

Hooker Chemicals & Plastics Corp.: *See*—
Salee, Gideon; and Rosenfeld, Jerold C., 4,255,555, Cl. 528-179.000.

Hooker, Ross B., III: *See*—
Armitage, John D., Jr.; Barkley, John A.; Hooker, Ross B., III; and Walker, James R., 4,255,042, Cl. 355-3.00R.

Hope, Henry F.; and Hope, Stephen F. Photographic film and paper processing equipment. 4,255,039, Cl. 354-320.000.

Hope, Stephen F.: *See*—
Hope, Henry F.; and Hope, Stephen F., 4,255,039, Cl. 354-320.000.

Horak, Jiri: *See*—
Cervenka, Juraj; Psenica, Jan; Horak, Miroslav; and Horak, Jiri, 4,254,649, Cl. 72-128.000.

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Cervenka, Juraj; Psenica, Jan; Horak, Miroslav; and Horak, Jiri, 4,254,649, Cl. 72-128.000.

Horii, Hiroshi: *See*—
Murakami, Hirokuni; and Horii, Hiroshi, 4,254,633, Cl. 62-155.000.

Horikoshi, Kouki: *See*—
Shibanai, Ichiro; Horikoshi, Kouki; and Nakamura, Nobuyuki, 4,255,249, Cl. 208-11.00R.

Horner, Larry E.: *See*—
Hoffmann, Arthur G.; Guberman, Robert P.; and Horner, Larry E., 4,255,787, Cl. 364-494.000.

Horodysky, Andrew G.; and Gemmill, Robert M., Jr., to Mobil Oil Corporation. Phosphorus-containing compounds and lubricants containing same. 4,255,271, Cl. 252-46.700.

Horton, Herbert D.: *See*—
Keast, Larry G.; and Horton, Herbert D., 4,254,655, Cl. 73-49.500.

Hoshino, Yasushi; Toida, Tooru; Tokunaga, Yukio; Tateishi, Kazuyoshi; and Takano, Rikuo, to Nippon Telegraph and Telephone Public Corporation. Electrostatic recording method and apparatus by doubly controlling ion flow. 4,255,043, Cl. 355-3.0SC.

Hosier, Kenneth E., Jr.: *See*—
Kaufman, Leon; and Hosier, Kenneth E., Jr., 4,255,659, Cl. 250-370.000.

Hoskinson, William R.: *See*—
Machanian, William V.; and Hoskinson, William R., 4,254,682, Cl. 84-1.010.

Hosomizu, Tohru: *See*—
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Houbion, John A.; and Dayawon, Miguel W., to Monsanto Company. Use of substituted-3-phenacylidenephthalides as corn plant growth regulants. 4,255,181, Cl. 71-88.000.

Houdaille Industries, Inc.: *See*—
Kamman, Gordon W.; and McLean, Ronald L., 4,254,847, Cl. 188-1.00B.

Hough, William V.; Little, John L.; and Warheit, Kevin E., to Mine Safety Appliances Company. Palladium alloy baths for the electroless deposition. 4,255,194, Cl. 106-1.240.

Houghton, Joseph Y.: *See*—
Burke, Oliver W., Jr.; and Hunt, Barbara P., 4,255,486, Cl. 428-356.000.

House, Harold D. Objective retinal response recorder. 4,255,023, Cl. 351-24.000.

Howe, Dennis G., to Eastman Kodak Company. Film scanner employing optical splice technique for frame-rate conversion. 4,255,764, Cl. 358-214.000.

Howell, John K., Jr., to Oxy Metal Industries Corporation. Coating bath composition and method. 4,255,305, Cl. 260-29.300.

Huang, Kwang T.; and Milner, Brian R., to United States of America, Navy. Dielectric corona rings. 4,255,615, Cl. 174-140.0CR.

Huber, Lothar, to LUK Lamellen und Kupplungsbau GmbH. Friction clutch. 4,254,853, Cl. 192-70.270.

Hubert, Peter: *See*—
Roselius, Ludwig; Kurzhals, Hans-Albert; and Hubert, Peter, 4,255,458, Cl. 426-424.000.

Hubertson, Folke H., to Aktiebolaget Somas Ventiler. Butterfly valve. 4,254,937, Cl. 251-305.000.

Hudson, John A.; James, Nicholas A.; and Morley, Edward G., to Plessey Handel und Investments AG. Hydraulic variable-displacement axial piston pump having torque limitation. 4,255,092, Cl. 417-222.000.

Huellwegen, Joseph, to Nixdorf Computer AG. Signal regenerating apparatus with DC compensation. 4,255,812, Cl. 375-4.000.

Huempfner, David F.; Rippe, Douglas A.; and Martin, Robert E., to American Hospital Supply Corporation. Stabilized elevator for stretcher or the like. 4,254,928, Cl. 248-422.000.

Huggins, Peter N., to Ciba-Geigy AG. Removable core for reeled web material. 4,254,918, Cl. 242-68.500.

Hughes Aircraft Company: *See*—
McGinness, Patrick J., 4,255,469, Cl. 427-282.000.

Hughes Company, Inc.: *See*—
Kumandan, Krishna R., 4,254,702, Cl. 99-638.000.

Hughes, Ronald F.: *See*—
Pacey, Grant K.; Hughes, Ronald F.; Trumble, William P.; and Lukas, Helmut H., 4,254,865, Cl. 206-316.000.

Hultsch, Gunther: *See*—
Ostermeyer, Peter; and Hultsch, Gunther, 4,254,904, Cl. 233-2.000.

Humble, David R.; and Dietrich, Marlene J., to Sensormatic Electronics Corporation. Enclosure for a security tag and extraction implement. 4,254,868, Cl. 206-484.000.

Hung, William M.: *See*—
Schmidt, Paul J.; and Hung, William M., 4,255,577, Cl. 546-94.000.

Hunt, Barbara P.: *See*—
Burke, Oliver W., Jr.; and Hunt, Barbara P., 4,255,486, Cl. 428-356.000.

Hunt, Walter H., IV; and Craig, Lynn W., to Rohm and Haas Company. Belt refurbishing. 4,254,589, Cl. 51-318.000.

Hunter Douglas International N.V.: *See*—
Vecchiarelli, Francis, 4,254,813, Cl. 160-19.000.
Vecchiarelli, Francis, 4,254,814, Cl. 160-19.000.

Hunter, James B.: *See*—
Bohm, John D.; and Hunter, James B., 4,255,417, Cl. 424-131.000.

Hurlock, John R.; and Goretta, Louis A., to Nalco Chemical Company. Discrete bead polymer process. 4,255,545, Cl. 526-201.000.

Hurst, Ivan R., to EMI Limited. Image forming apparatus. 4,255,658, Cl. 250-332.000.

Hwa, Chih M.; and Cuisia, Dionisio G., to Chemed Corporation. Scale inhibition. 4,255,259, Cl. 210-699.000.

Hyde Products, Inc.: *See*—
Blonski, Paul, 4,254,543, Cl. 29-517.000.

Hylsa, S.A.: *See*—
Flores-Verdugo, Marco A.; Chapa-Martinez, Leobardo; and Price-Falcon, Juan F., 4,254,876, Cl. 209-577.000.

Hyogo Prefectural Government of Japan: *See*—
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Ida, Masatoshi: *See*—
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Idemitsu Kosan Co., Ltd.: *See*—
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Igarashi, Akira, to Fuji Photo Film Co., Ltd. Heat-sensitive recording paper. 4,255,491, Cl. 428-537.000.

Igarashi, Isao: *See*—
Noguchi, Masaaki; Tanaka, Yukiyasu; and Igarashi, Isao, 4,254,745, Cl. 123-51.00B.

Igelbuscher, Heinrich: *See*—
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Ikarashi, Hideo: *See*—
Kawai, Yoshio; Kida, Koichi; Ikarashi, Hideo; Toki, Tsukasa; and Suzuki, Yoshiharu, 4,255,592, Cl. 568-573.000.

Ikegami, Mitsuru: *See*—
Toida, Ryuji; Sakai, Yuji; and Ikegami, Mitsuru, 4,255,682, Cl. 310-168.000.

Illinois Power Company: *See*—
Geier, Julius D., 4,254,822, Cl. 165-48.00S.

Illy, Ernesto. Coffee machine. 4,254,694, Cl. 99-295.000.

Imada, Yukio; and Mizuno, Sumiko, to Mitsubishi Chemical Industries, Limited. 9-α-Hydroxy steroids. 4,255,344, Cl. 260-397.100.

Imai, Fusao: *See*—
Shimoyashiki, Nobuyoshi; Masukawa, Teruo; and Imai, Fusao, 4,255,371, Cl. 264-54.000.

Imamura, Naoki; Fukui, Isao; and Ono, Junichi, to Shimadzu Corporation. Apparatus for emission spectrochemical analysis. 4,255,051, Cl. 356-306.000.

Imamura, Yoshinori: *See*—
Maruyama, Eiichi; Imamura, Yoshinori; Ataka, Saburo; Inao, Kiyohisa; Takasaki, Yukio; Tsukada, Toshihisa; and Hirai, Tadaaki, 4,255,686, Cl. 313-366.000.

Imazu, Syuichi, to Hitachi, Ltd. Multitubular heat exchanger. 4,254,825, Cl. 165-114.000.

IMC-Carver Foundry Products, Inc.: *See*—
Abraham, Edward D.; and Riha, Robert F., 4,254,984, Cl. 294-88.000.

Imura, Toshinori: *See*—
Inagaki, Tetsuhiko; and Imura, Toshinori, 4,255,691, Cl. 315-241.00P.

Inada, Kohji: *See*—
Miyake, Tetsuya; Inada, Kohji; and Asano, Motohisa, 4,255,607, Cl. 585-805.000.

Inada, Masami; Kitamura, Kazuhiko; Ito, Shoji; Nonoyama, Takao; and Tsuji, Riichi, to Aisin Seiki Kabushiki Kaisha; and Toyota Jidosha Kogyo Kabushiki Kaisha. Suction pressure responsive valve device. 4,254,938, Cl. 251-367.000.

Inagaki, Tetsuhiko; and Imura, Toshinori, to Minolta Camera Kabushiki Kaisha. Shockproof electronic flash device. 4,255,691, Cl. 315-241.00P.

Inao, Kiyohisa: *See*—
Maruyama, Eiichi; Imamura, Yoshinori; Ataka, Saburo; Inao, Kiyohisa; Takasaki, Yukio; Tsukada, Toshihisa; and Hirai, Tadaaki, 4,255,686, Cl. 313-366.000.

Industrial Electronic Rubber Co.: *See*—
Murray, Myles N., 4,255,479, Cl. 428-131.000.

Ing. C. Olivetti & C., S.p.A.: *See*—
Zaltieri, Adriano; and Coli, Giuseppe, 4,255,063, Cl. 400-568.000.

Ingle, James E.: *See*—
McGee, Dean A.; Ingle, James E.; and Lane, Alan J., 4,254,993, Cl. 299-10.000.

Inland Steel Company: *See*—
Bhattacharya, Debanshu; Quinto, Dennis T.; and Holowaty, Michael O., 4,255,187, Cl. 75-123.0AA.
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Innoventa ApS: *See*—
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Inoue, Morio: *See*—
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Inoue, Noboru: *See*—
Miyata, Seiji; Akagawa, Masatake; Yamamoto, Masahiro; and Inoue, Noboru, 4,254,779, Cl. 128-731.000.

Institut Cerac S.A.: *See*—
Lemcke, Bo; and Raybould, Derek, 4,255,374, Cl. 264-111.000.

Institut Francais du Petrole: *See*—
Dawans, Francois; and Binet, Daniel, 4,255,524, Cl. 521-54.000.

Institute Po Mechanika I Biomechanika: *See*—
Georgiev, Vesselin Y.; and Mednikarov, Vladimir S., 4,254,913, Cl. 239-204.000.

International Business Machines Corporation: *See*—
Adler, Roy L., 4,255,811, Cl. 375-2.000.
Armitage, John D., Jr.; Barkley, John A.; Hooker, Ross B., III; and Walker, James R., 4,255,042, Cl. 355-3.00R.
Conant, Jay W.; Fisher, Donald W.; and Fox, David D., 4,255,216, Cl. 156-80.000.
Keidl, Steven D., 4,255,693, Cl. 318-685.000.
Perez, Henry S.; and Schwarz, Theodore A., 4,255,772, Cl. 360-113.000.
Wilson, Joseph T., III, 4,255,708, Cl. 324-208.000.

International Flavors & Fragrances Inc.: *See*—
Mussinan, Cynthia J.; Mookherjee, Braja D.; Vock, Manfred H.; Schmitt, Frederick L.; Shuster, Edward J.; Sanders, James M.; Light, Bette M.; and Granda, Edward J., 4,255,460, Cl. 426-538.000.
Sprecker, Mark A.; Hall, John B.; and Schmitt, Frederick L., 4,255,275, Cl. 252-174.110.
Wilson, Richard A.; Schreiber, William L.; Mookherjee, Braja D.; Kiwala, Jacob; Vinals, Joaquin F.; Vock, Manfred H.; Stork, Gilbert; and Schmitt, Frederick L., 4,255,293, Cl. 252-522.00R.
Withycombe, Donald A.; Mookherjee, Braja D.; Mussinan, Cynthia J.; Vock, Manfred H.; and Giacino, Christopher, 4,255,583, Cl. 548-146.000.

International Harvester Company: *See*—
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International Minerals & Chemical Corp.: *See*—
Jenkins, Jerold D.; Falconer, Robert A.; and Hentz, Donald A., 4,254,565, Cl. 37-195.000.

International Rectifier Corporation: *See*—
Hikin, Boris L., 4,255,757, Cl. 357-58.000.

International Telephone and Telegraph Corporation: *See*—
Ash, Stanley P., 4,254,650, Cl. 72-357.000.
Borsuk, Leslie M., 4,255,016, Cl. 350-96.210.
Noble, Walter J.; and Small, John W., 4,255,752, Cl. 343-771.000.

Inventio AG: *See*—
Geiger, Werner, 4,254,816, Cl. 164-173.000.

IOlympus Optical Co., Ltd.: *See*—
Suzuki, Takeomi; Oinoue, Kenichi; Aoki, Masahiro; Kenjyo, Hideyuki; and Ida, Masatoshi, 4,255,654, Cl. 250-204.000.

Ionics, Incorporated: *See*—
Parent, Richard G.; and Elyanow, Irving D., 4,255,012, Cl. 339-242.000.

IPCO Hospital Supply Corporation: *See*—
Weissman, Bernard, 4,255,145, Cl. 433-165.000.

Isaac, Peter A. H., to Engelhard Minerals & Chemicals Corporation. Pressure-sensitive record material and preparation thereof. 4,254,971, Cl. 282-27.500.

Isalski, Wieslaw H.; and Tomlinson, Terence R., to Petrocarbon Developments Limited. Treatment of ammonia synthesis purge gas. 4,255,406, Cl. 423-359.000.

Ishida, Toshihiko; Nakazawa, Yukio; Shiba, Haruo; and Tanaka, Kimio, to TDK Electronics Company Limited. Magnetic tape cassette. 4,254,923, Cl. 242-199.000.

Ishihara, Masao: *See*—
Shibue, Toshiaki; Nagayasu, Koichi; Mayama, Masayoshi; Ishihara, Masao; and Abe, Naoto, 4,255,515, Cl. 430-495.000.

Ishihara, Norisue. Louver shutter with movable louver boards. 4,254,581, Cl. 49-82.000.

Ishii, Seiji: *See*—
Yukuta, Toshio; Fukuda, Hiroya; and Ishii, Seiji, 4,255,526, Cl. 521-108.000.

Ishii, Shigeru: *See*—
Ozawa, Kiyomi; Ishii, Shigeru; Hayashi, Mamoru; Hirose, Masayoshi; and Hirata, Kiminori, 4,255,447, Cl. 424-304.000.

Ishikawa, Masami; Okano, Hirochika; Katagiri, Shigenobu; Asano, Mitsugu; and Fujieda, Toshiaki, to Hitachi Koki Company Limited. Printing magnet drive device. 4,254,705, Cl. 101-93.290.

Ishizaki, Hirofumi: *See*—
Chiba, Shoichi; Konuma, Kunio; and Ishizaki, Hirofumi, 4,254,746, Cl. 123-52.00M.

Israels, Cletus: *See*—
Dundon, Carl M.; and Israels, Cletus, 4,254,955, Cl. 273-148.00R.

Itakura, Tsuyoshi: *See*—
Willinger, Allan H.; and Itakura, Tsuyoshi, 4,255,648, Cl. 219-523.000.

Ito, Shoji: *See*—
Inada, Masami; Kitamura, Kazuhiko; Ito, Shoji; Nonoyama, Takao; and Tsuji, Riichi, 4,254,938, Cl. 251-367.000.

Ito, Yoshitoshi: *See*—
Takeyasu, Kiyoo; Kato, Kanji; Goto, Tatsuo; Oouchi, Yoozoo; Yoshida, Kazuhiro; Ito, Yoshitoshi; and Takami, Katsumi, 4,255,762, Cl. 358-100.000.

Itoh, Kunio; and Inoue, Morio, to Matsushita Electric Industrial Co., Ltd. Heterostructure semiconductor device having a top layer etched to form a groove to enable electrical contact with the lower layer. 4,255,755, Cl. 357-18.000.

Itou, Toshinao: *See*—
Natsume, Isamu; Kobayashi, Yoshimichi; and Itou, Toshinao, 4,255,466, Cl. 427-113.000.

Itron, Inc.: *See*—
Lambert, Daryl G.; Sage, Howard M.; and Ester, Lee W., 4,254,707, Cl. 101-123.000.

Iwao, Jun-ichi; Oya, Masayuki; and Chiba, Takehisa, to Santen Pharmaceutical Co. Ltd. Cysteine derivatives. 4,255,446, Cl. 424-301.000.

Iwasaki, Akio: *See*—
Watanabe, Isamu; Iwasaki, Akio; and Mori, Toshihito, 4,255,421, Cl. 424-180.000.

Iwatani Sangyo Kabushiki Kaisha: *See*—
Kidowaki, Yoshimasa; and Okamoto, Shiro, 4,254,817, Cl. 164-252.000.

J. B. Foote Foundry Co., The: *See*—
Hauser, Hans, 4,255,493, Cl. 428-546.000.

J. I. Case Company: *See*—
Tucek, Frank J., 4,254,807, Cl. 144-34.00E.

J. M. Voith GmbH: *See*—
Schiel, Christian, 4,254,561, Cl. 34-124.000.

Jabbal, Harbhajan S. Ground fault interruptor. 4,255,773, Cl. 361-45.000.
Jack, James: *See*—
Hewitt, Brian; Hobday, Cyril; Jack, James; and Keenan, John F. E., 4,255,152, Cl. 8-583.000.
Jacobs, David R.: *See*—
Spanel, Abram N.; and Jacobs, David R., 4,254,718, Cl. 112-79.00R.
Jacobs, Eugene A. Mechanized crutch. 4,254,948, Cl. 272-70.300.
Jacobs, Harvey B. Pop top can sealer. 4,254,889, Cl. 220-234.000.
Jacques, Donald F.: *See*—
Klaessig, Frederick C.; and Jacques, Donald F., 4,255,309, Cl. 260-29.6WB.
Jaeger, Franz: *See*—
Sahm, Karl-Frieder; van Rensen, Enno; Rieger, Horst; and Jaeger, Franz, 4,255,049, Cl. 356-32.000.
Jagenberg Werke Aktiengesellschaft: *See*—
Schadowski, Werner; and Bellut, Heinrich, 4,254,693, Cl. 493-60.000.
"Jaguar" Stahlwaren Vertriebsgesellschaft mbH & Co.: *See*—
Megna, Salvatori G.; and Pracht, Gunther, 4,254,551, Cl. 30-341.000.
James Howden & Company Limited: *See*—
Wilson, Robert R.; and Falconer, Roy D., 4,255,080, Cl. 415-53.00R.
James, Nicholas A.: *See*—
Hudson, John A.; James, Nicholas A.; and Morley, Edward G., 4,255,092, Cl. 417-222.000.
Janik, Carl L. Bulletin display board. 4,254,569, Cl. 40-606.000.
Janome Sewing Machine Co. Ltd.: *See*—
Takenoya, Hideaki, 4,254,726, Cl. 112-315.000.
Japan Metals & Chemicals Co., Ltd.: *See*—
Nakamura, Yoshiyuki; Matsubara, Seiichi; Matsui, Takashi; Kumagai, Taiji; Senga, Taizo; and Fukutsu, Tsutomu, 4,255,184, Cl. 75-10.00R.
Japan Styrene Paper Corporation: *See*—
Otsuka, Isao, 4,255,110, Cl. 425-381.000.
Shimoyashiki, Nobuyoshi; Masukawa, Teruo; and Imai, Fusao, 4,255,371, Cl. 264-54.000.
Japan Synthetic Rubber Co., Ltd.: *See*—
Makino, Kenya; Miyabayashi, Toshio; Ohshima, Noboru; and Takeuchi, Yasumasa, 4,255,543, Cl. 526-92.000.
Jarrett, Boaz A., to Lucas Industries Limited. Solenoid construction. 4,254,935, Cl. 251-137.000.
Jasovsky, George A.; and Gottesman, Martin, to General Foods Corporation. Preparation of a decaffeinated roasted coffee blend. 4,255,461, Cl. 426-595.000.
Jaunin, Jean-Pierre, to Societe Suisse Pour l'Industrie Horlogere Management Services S.A. Data introducing arrangement. 4,255,805, Cl. 368-108.000.
Jeffries, Kerry P. Water aerator and method. 4,255,360, Cl. 261-5.000.
Jelinek, Jerry G., to Parker-Hannifin Corporation. Sealing device. 4,254,960, Cl. 277-12.000.
Jenkins, Jerold D.; Falconer, Robert A.; and Hentz, Donald A., to International Minerals & Chemical Corp. Method for the segmented mining and drying of bentonite. 4,254,565, Cl. 37-195.000.
Jensen, Johannes: *See*—
Eriksson, Einer; Jensen, Johannes; and Lundsgaard, Jorgen S., 4,254,790, Cl. 137-100.000.
Jeppsson, Jan-Bertil, to AB Akerlund & Rausing. Stackable cover member for a container. 4,254,891, Cl. 270-359.000.
JGF, Incorporated: *See*—
Joyce, Michael F., 4,255,782, Cl. 363-8.000.
Jimenez-Alfaro, Jose: *See*—
Uriarte del Rio, Juan; and Jimenez-Alfaro, Jose, 4,254,570, Cl. 42-2.000.
Johansson, Anders E. B.: *See*—
Bergstedt, Dan; and Johansson, Anders E. B., 4,254,625, Cl. 60-602.000.
Johansson, Hans A. V. Bath tubs. 4,254,516, Cl. 4-559.000.
Johnson, Allen S., Jr. Apparatus and method for treating an aggregate material with a flowing gas. 4,255,130, Cl. 432-14.000.
Johnson, Allen S., Jr. Apparatus and method for heating an aggregate material. 4,255,131, Cl. 432-14.000.
Johnson, Andrew C. Measuring device. 4,254,553, Cl. 33-169.00R.
Johnson, Bruce K.; and Whiteside, George D., to Polaroid Corporation. Camera with proportional fill flash quench strobe. 4,255,030, Cl. 354-27.000.
Johnson, Bruce K.; Whiteside, George D.; and LaRocque, Arthur G., to Polaroid Corporation. Photographic camera with dual purpose light indicator. 4,255,031, Cl. 354-53.000.
Johnson Controls, Inc.: *See*—
Hayes, Thomas E., 4,254,906, Cl. 236-78.00D.
Johnson Corporation, The: *See*—
Wiedenbeck, Roger D.; Boughton, Kenneth W.; and Maurer, Richard, 4,254,972, Cl. 285-61.000.
Johnson, Edwin A.: *See*—
Hartford, Thomas W.; Johnson, Edwin A.; and Russo, Frank A., 4,255,789, Cl. 364-431.000.
Johnson, John H.: *See*—
Fields, Joseph E.; Asculai, Samuel S.; and Johnson, John H., 4,255,537, Cl. 525-328.000.
Johnson & Johnson Dental Products Company: *See*—
Marshall, Kenneth H., 4,255,140, Cl. 433-40.000.
Johnson, Matthey & Co., Limited: *See*—
Enga, Bernard E., 4,254,739, Cl. 122-4.00D.
Johnson Matthey, Inc.: *See*—
Bohm, John D.; and Hunter, James B., 4,255,417, Cl. 424-131.000.
Johnson, Richard D.: *See*—
Carrico, Robert J.; and Johnson, Richard D., 4,255,566, Cl. 536-27.000.
Johnson, Robert W.; and Raddi, William J., to ESB Inc. Emergency lighting and fire detector system. 4,255,746, Cl. 340-577.000.
Johnston, David B. R.: *See*—
Beattie, Thomas R.; Hannah, John; and Johnston, David B. R., 4,255,423, Cl. 424-246.000.
Johnston, Elizabeth D. Brassiere for strenuous physical activity. 4,254,777, Cl. 128-465.000.
Johnston, Robert J.; Layciak, Stephen G.; and Cametti, George M., to Westinghouse Electric Corp. Push-pull switch operator. 4,255,633, Cl. 200-153.00J.
Joly, Jean; and Puthon, Joseph, to Rhone-Poulenc-Textile. Pile textile elements. 4,255,476, Cl. 428-82.000.
Jones, Gordon H.; and Young, John, to Syntex (U.S.A.) Inc. Naphthoquinone anti-psoriatic agents. 4,255,405, Cl. 424-311.000.
Jones, Kenneth R., to Mustang Tripsaver Inc. Technique for damping oscillations in a drill string. 4,254,837, Cl. 175-67.000.
Jones, Ronald H.; and Pryde, Alexander W. H., to United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Defence in Her Britannic Majesty's Government of the. Process for the production of hexanitrostilbene. 4,255,358, Cl. 568-931.000.
Jonsereds AB: *See*—
Svenning, Sven, 4,255,076, Cl. 414-729.000.
Jordan, Robert K. Production of isocyanic acid and isocyanates. 4,255,453, Cl. 423-365.000.
Joyce, Michael F., to JGF, Incorporated. Electrical energy conversion systems. 4,255,782, Cl. 363-8.000.
Joyner, James M.: *See*—
Barkis, Edward; Crummer, Robert R.; and Joyner, James M., 4,255,323, Cl. 260-45.75N.
Judice, Charles N.: *See*—
Gabbe, John D.; Judice, Charles N.; and London, Thomas B., 4,255,796, Cl. 364-900.000.
Julian, Emile E. Perspective view apparatus. 4,254,555, Cl. 33-434.000.
Julius Blum Gesellschaft m.b.H.: *See*—
Rock, Erich; and Mages, Bernhard, 4,255,002, Cl. 312-348.000.
Jullien, Eugenie L., to Compagnie Internationale d'et de Realisations Electrotechniques. Lamp socket assembly. 4,255,010, Cl. 339-176.00L.
Jung, Hermann; and Spennes, Gunter, to Kutsch-Consult GmbH, by said Gunter Spennes. Apparatus for rapid machine composting of sewage sludge. 4,255,389, Cl. 422-209.000.
Jung, Margarete, to Varta Batterie, A.G. Galvanic element with negative zinc electrode. 4,255,503, Cl. 429-201.000.
Junggren, Ulf K.; and Sjostrand, Sven E., to Aktiebolaget Hassle. Gastric acid secretion inhibiting substituted 2-(2-benzimidazolyl)-pyridines, pharmaceutical preparations containing same, and method for inhibiting gastric acid secretion. 4,255,431, Cl. 424-263.000.
Juntgen, Harald: *See*—
Gappa, Gunther; Juntgen, Harald; Klein, Jurgen; and Schulz, Peter, 4,255,072, Cl. 406-89.000.
K-Whit Tools Incorporated: *See*—
White, Kenneth R.; and Hancock, John P., 4,255,119, Cl. 431-150.000.
Kabushiki Kaisha Kawai Gakki Seisakusho: *See*—
Kugisawa, Toshio; and Sakashita, Noriji, 4,254,681, Cl. 84-1.010.
Kabushiki Kaisha Sankyo Seiki Seisakusho: *See*—
Komatsu, Fumito; Kudo, Yasuto; and Kamijima, Tadashi, 4,254,856, Cl. 192-415.000.
Kabushiki Kaisha Toyoda Jidoshokki Seisakusho: *See*—
Miyamoto, Noriaki; Shiraki, Masao; and Mitsuya, Kinpei, 4,254,612, Cl. 57-58.950.
Miyamoto, Noriaki; Shiraki, Masao; and Mitsuya, Kinpei, 4,254,614, Cl. 57-58.890.
Kadelbach, Volker: *See*—
Sauer, Joseph; Kadelbach, Volker; and Will, Gerhard, 4,254,671, Cl. 74-866.000.
Kagami, Toshio: *See*—
Miyoshi, Shigeto; and Kagami, Toshio, 4,255,314, Cl. 260-32.80R.
Kaide, Tamotsu; Gozen, Toshikazu; Taniguchi, Jinichi; and Ohta, Yutaka, to Dainichi-Nippon Cables, Ltd. Fire-retardant putty-like compositions. 4,255,318, Cl. 260-42.180.
Kaiser, Roman; and Lamparsky, Dietmar, to Givaudan Corporation. Novel odorants and flavorants. 4,255,337, Cl. 260-346.110.
Kalinin, Viktor P.; Avdjukhin, Sergei P.; Lebedev, Vsevolod I.; Zhilin, Viktor F.; Frolov, Vladimir S.; Anisimov, Jury V.; Slavin, Jury T.; and Larionov, Valentin N. Method for manufacturing highly refractory aluminum and magnesium oxide ceramic items. 4,255,373, Cl. 264-65.000.
Kaloshin, Valentin A.: *See*—
Zatsepin, Nikolai N.; Siljuk, Viktor F.; Malko, Ivan I.; Kaloshin, Valentin A.; Aniskovich, Valery M.; Naumenko, Nikolai N.; and Perfiliev, Vladimir V., 4,255,709, Cl. 324-229.000.
Kamijima, Tadashi: *See*—
Komatsu, Fumito; Kudo, Yasuto; and Kamijima, Tadashi, 4,254,856, Cl. 192-415.000.
Kamman, Gordon W.; and McLean, Ronald L., to Houdaille Industries, Inc. Rubber viscous torsional dampers and method of making same. 4,254,847, Cl. 188-1.00B.
Kanamaru, Hisanobu: *See*—
Kurosawa, Takuzo; Dewa, Seiki; Kikuchi, Yuzuru; and Kanamaru, Hisanobu, 4,255,113, Cl. 425-411.000.

Kane, James, to RCA Corporation. Method for fabricating a diffractive subtractive filter embossing master. 4,255,514, Cl. 430-320.000.

Kane, Sydney H.; and Margulies, Erwin, to Ciba-Geigy Corporation. Method for reduction of cardiac mortality rate using pyrazolidine-3,5-diones. 4,255,438, Cl. 424-273.00P.

Kaneko, Yoichi: *See*—
Sekine, Kenji; and Kaneko, Yoichi, 4,255,730, Cl. 333-247.000.

Kanner, Bernard: *See*—
Herdle, William B.; and Kanner, Bernard, 4,255,348, Cl. 556-410.000.

Kaplan, Fred A.: *See*—
Emmons, William D.; Sperry, Peter R.; and Kaplan, Fred A., 4,255,196, Cl. 106-29.000.

Katagiri, Shigenobu: *See*—
Ishikawa, Masami; Okano, Hirochika; Katagiri, Shigenobu; Asano, Mitsugu; and Fujieda, Toshiaki, 4,254,705, Cl. 101-93.290.

Katakura, Kageyoshi: *See*—
Kuroda, Masao; Ono, Sekijyuro; Katakura, Kageyoshi; and Kondo, Toshio, 4,254,662, Cl. 73-626.000.

Kataoka, Richard W.: *See*—
Borkat, Franklin R.; and Kataoka, Richard W., 4,255,653, Cl. 235-495.000.

Katchka, Jay R., to Robertshaw Controls Company. Electric ignition system. 4,255,118, Cl. 431-46.000.

Katcs, Michael W.; De Luca, Peter J.; and Pretorius, Peter S., to Burco (Proprietary) Limited. Barbecue pack. 4,254,863, Cl. 206-216.000.

Kato, Kanji: *See*—
Takeyasu, Kiyoo; Kato, Kanji; Goto, Tatsuo; Oouchi, Yoozoo; Yoshida, Kazuhiro; Ito, Yoshitoshi; and Takami, Katsumi, 4,255,762, Cl. 358-100.000.

Katoh, Kazunobu; Fujita, Saburo; Otaki, Toshihiro; and Nakashima, Shozi, to Fuji Photo Film Co., Ltd.; and Toray Industries, Inc. Photographic support containing different polyester layers. 4,255,516, Cl. 430-533.000.

Katsura, Tadahiko, to Toyo Seikan Kaisha Limited. Olefin-vinyl alcohol-vinyl acetal copolymers, process for preparation thereof and laminate structures including said copolymers. 4,255,490, Cl. 428-483.000.

Kaufer, Wilhelm: *See*—
Gebauer, Peter; Kaufer, Wilhelm; and Mohrke, Helmut, 4,255,462, Cl. 427-27.000.

Kaufman, Leon; and Hosier, Kenneth E., Jr., to University of California, The Regents of the. Semiconductor radiation detector. 4,255,659, Cl. 250-370.000.

Kaufmann, Frank H.; and Kramer, Charles F., to Steel Heddle Manufacturing Co. Apparatus for reinforcing a heddle frame slat of a loom. 4,254,802, Cl. 139-91.000.

Kaukeinen, Joseph Y.: *See*—
Van Allan, James A.; Rossi, Louis J.; Bloom, Melvin S.; Regan, Michael T.; Wright, Hal E.; and Kaukeinen, Joseph Y., 4,255,506, Cl. 430-41.000.

Kawabata, Tsuneo; Makita, Minoru; and Masuzawa, Sigeaki, to Sharp Kabushiki Kaisha. Microwave oven with a programmable digital control circuit. 4,255,639, Cl. 219-10.55B.

Kawade, Takashi: *See*—
Matsuda, Hideo; Yuki, Kiyohiro; Kawade, Takashi; Adachi, Takaaki; and Hanabe, Kenichi, 4,255,766, Cl. 358-257.000.

Kawai, Yoshio; Kida, Koichi; Ikarashi, Hideo; Toki, Tsukasa; and Suzuki, Yoshiharu, to Mitsubishi Gas Chemical Company, Inc. Process for producing aromatic primary hydroperoxide. 4,255,592, Cl. 568-573.000.

Kawasaki Steel Corporation: *See*—
Morito, Nobuyuki; Sugiyama, Toshitomo; and Obata, Yoshio, 4,255,205, Cl. 148-113.000.

Kawazoe, Kenichiro: *See*—
Aoki, Toshio; Takayama, Atsumi; Matsuuchi, You; Baba, Mikito; and Kawazoe, Kenichiro, 4,254,665, Cl. 74-10.330.

KBG Corporation: *See*—
Benedetto, Kenneth R.; and Linder, Larry J., 4,254,659, Cl. 73-516.0LM.

Keast, Larry G.; and Horton, Herbert D., to World Wide Oil Tools, Inc. Hydraulic fill valve. 4,254,655, Cl. 73-49.500.

Keebler Company: *See*—
Prager, Edward N.; and Burnett, Louis E., 4,254,601, Cl. 53-133.000.

Keeley, Charles: *See*—
Brecker, Lawrence R.; and Keeley, Charles, 4,255,320, Cl. 260-45.750.

Keenan, John F. E.: *See*—
Hewitt, Brian; Hobday, Cyril; Jack, James; and Keenan, John F. E., 4,255,152, Cl. 8-583.000.

Kehl, Jason S.: *See*—
Bosch, Mahlon L.; and Kehl, Jason S., 4,255,608, Cl. 174-5.00R.

Keidl, Steven D., to International Business Machines Corporation. Closed loop stepper motor circuitry without encoder. 4,255,693, Cl. 318-685.000.

Keihin Electric Express Railway Co., Ltd.: *See*—
Saito, Hideo, 4,255,619, Cl. 179-2.00A.

Kelley, Eugene M. Stabilized oscillating chair. 4,254,990, Cl. 297-273.000.

Kelley, John R.; and Wyse, Harold G. Thermal protective switch. 4,255,736, Cl. 337-407.000.

Kelly, Arnold J., to Exxon Research & Engineering Co. Electrostatic atomizing device. 4,255,777, Cl. 361-228.000.

Kelly, Hugh-Peter G., to A.E.S. Wordplex Limited. Printing device with paper edge sensing. 4,255,064, Cl. 400-708.000.

Kelly, Samuel T., to Robertshaw Controls Company. Gas regulator valve with step opening characteristic. 4,254,796, Cl. 137-489.000.

Kelly, Thomas M.: *See*—
Zeitzoff, Peter M.; Lee, Teh-Hsuang; Burkey, Bruce C.; Khosla, Rajinder P.; and Kelly, Thomas M., 4,255,760, Cl. 358-41.000.

Kelly, William R. Device for bending metal objects. 4,254,651, Cl. 72-389.000.

Kelsey-Hayes Company: *See*—
Rozmus, Walter J., 4,255,103, Cl. 425-78.000.

Kenjyo, Hideyuki: *See*—
Suzuki, Takeomi; Oinoue, Kenichi; Aoki, Masahiro; Kenjyo, Hideyuki; and Ida, Masatoshi, 4,255,654, Cl. 250-204.000.

Kennedy, William L.: *See*—
Gauer, Joseph A.; and Kennedy, William L., 4,254,641, Cl. 68-23.700.

Kenney Manufacturing Company: *See*—
Comeau, Paul E., 4,254,815, Cl. 160-126.000.

Kentosh, James M., to Amtel, Inc. Mooring installation. 4,254,523, Cl. 9-8.00P.

Keogh, Michael J., to Union Carbide Corporation. Polyethylene composition containing talc filler for electrical applications. 4,255,303, Cl. 260-23.00H.

Kepros-Ganes Company: *See*—
Collias, George J., 4,255,457, Cl. 426-407.000.

Kernforschungsanlage Julich Gesellschaft mit beschrankter Haftung: *See*—
Forster, Siegfried; and Kleemann, Manfred, 4,254,827, Cl. 165-166.000.

Kernforschungszentrum Karlsruhe Gesellschaft mit beschrankter Haftung: *See*—
Obert, Wolfgang; and Durr, Siegfried, 4,255,237, Cl. 204-9.000.

Kerr-McGee Corporation: *See*—
McGee, Dean A.; Ingle, James E.; and Lane, Alan J., 4,254,993, Cl. 299-10.000.

Kerr, Robert M.; and Crabtree, George F. Lower unit repair fixture. 4,254,946, Cl. 269-152.000.

Kessinger, Orville E.; and Lamport, Ivan R., to Caterpillar Tractor Co. Engine flywheel and interconnecting drive shaft. 4,254,668, Cl. 74-572.000.

Ketchpel, Richard D., to Rockwell International Corporation. Electrical interconnect. 4,255,613, Cl. 174-88.00R.

Keuffel & Esser Company: *See*—
Kooi, J. Peter E., 4,254,925, Cl. 248-180.000.

Kew Research Limited: *See*—
Crofts, Michael E.; Peevers, Michael S.; and Peevers, Eileen S., 4,255,226, Cl. 156-541.000.

Kho, James K.: *See*—
Charlebois, Leonard J.; and Kho, James K., 4,255,609, Cl. 174-41.000.

Khosla, Rajinder P.: *See*—
Zeitzoff, Peter M.; Lee, Teh-Hsuang; Burkey, Bruce C.; Khosla, Rajinder P.; and Kelly, Thomas M., 4,255,760, Cl. 358-41.000.

Khydyrov, Dzhavid N. O.: *See*—
Aliev, Vagab S.; Aliev, Sakhib M. O.; Gadzhiev, Farrukh R. O.; Guseinov, Novruz I. O.; Mamedov, Shamkhal A. M. O.; Mardanov, Medzhid A.; Sverdlov, Rafail S.; and Khydyrov, Dzhavid N. O., 4,255,350, Cl. 260-453.00P.

Kida, Koichi: *See*—
Kawai, Yoshio; Kida, Koichi; Ikarashi, Hideo; Toki, Tsukasa; and Suzuki, Yoshiharu, 4,255,592, Cl. 568-573.000.

Kidani, Yoshinori; Okamoto, Koji; and Saito, Reiko, to Kidani, Yoshinori. Platinum complex. 4,255,347, Cl. 260-429.00R.

Kidde, Inc.: *See*—
Higgins, Eldon C., 4,254,545, Cl. 29-558.000.

Kidowaki, Yoshimasa; and Okamoto, Shiro, to Iwatani Sangyo Kabushiki Kaisha. Metal casting apparatus. 4,254,817, Cl. 164-252.000.

Kiel, Gary J.: *See*—
Danner, Dean W.; and Kiel, Gary J., 4,255,618, Cl. 179-1.00B.

Kigawa, Hiroshi: *See*—
Wakihira, Kazuo; Kikumoto, Satoshi; Kigawa, Hiroshi; Nozaki, Osamu; and Minami, Michio, 4,255,563, Cl. 536-8.000.

Kikuchi, Kikuo. Temperature sensing switch with an optical sensor. 4,255,655, Cl. 250-231.00R.

Kikuchi, Yuzuru: *See*—
Kurosawa, Takuzo; Dewa, Seiki; Kikuchi, Yuzuru; and Kanamaru, Hisanobu, 4,255,113, Cl. 425-411.000.

Kikumoto, Satoshi: *See*—
Wakihira, Kazuo; Kikumoto, Satoshi; Kigawa, Hiroshi; Nozaki, Osamu; and Minami, Michio, 4,255,563, Cl. 536-8.000.

Kilchenman, James M.: *See*—
Marshall, John J.; and Kilchenman, James M., 4,254,998, Cl. 303-20.000.

Kim, Sang J. Hair piece having a comb-shaped attaching member. 4,254,783, Cl. 132-11.00R.

Kim, Tai K., to GTE Products Corporation. Process for separating molybdeum values from tungsten values. 4,255,396, Cl. 423-54.000.

Kimura, Akio; and Asahi, Satoshi, to Idemitsu Kosan Co., Ltd. Process for polymerization of ethylene. 4,255,544, Cl. 526-124.000.

King Industries, Inc.: *See*—
Gallacher, Lawrence V.; and Rydzik, Rachelle M., 4,255,395, Cl. 423-24.000.

King, Robert R., to Conair Corporation. Strain-relief member for reducing torsional strains in line cord. 4,255,006, Cl. 339-58.000.

King, Samuel B. Gasoline and petroleum fuel supplements. 4,255,158, Cl. 44-56.000.

King-Seeley Thermos Co.: *See*—
Anderson, Gordon H.; Nelson, David R.; and Fetterly, Richard T., 4,254,586, Cl. 51-163.100.
Stanford, Ralph F.; and Christensen, Donald R., 4,254,896, Cl. 222-108.000.
Kinoshita, Yasuaki; and Tabuchi, Toyoji, to Hitachi, Ltd. Surface acoustic wave filter. 4,255,726, Cl. 333-195.000.
Kioritz Corporation: *See*—
Satoh, Masatoshi, 4,254,550, Cl. 30-276.000.
Kirschner, Frank, to Soundcoat Company, Inc., The. Damping ring for rotating assemblies. 4,254,985, Cl. 295-7.000.
Kistler Instrumente AG: *See*—
Sonderegger, Hans C.; and Meyer, Urs B., 4,255,163, Cl. 51-169.000.
Kitajima, Masao; Arai, Fuminori; and Kondo, Asaji, to Fuji Photo Film Co., Ltd. Multilayered integral element for the chemical analysis of the blood. 4,255,384, Cl. 422-57.000.
Kitajima, Nobuo: *See*—
Hanada, Hiroshi; Kitajima, Nobuo; and Masaki, Tatsuo, 4,255,505, Cl. 430-31.000.
Kitamura, Kazuhiko: *See*—
Inada, Masami; Kitamura, Kazuhiko; Ito, Shoji; Nonoyama, Takao; and Tsuji, Riichi, 4,254,938, Cl. 251-367.000.
Kiwala, Jacob: *See*—
Wilson, Richard A.; Schreiber, William L.; Mookherjee, Braja D.; Kiwala, Jacob; Vinals, Joaquin F.; Vock, Manfred H.; Stork, Gilbert; and Schmitt, Frederick L., 4,255,293, Cl. 252-522.00R.
Kiyama, Satoshi: *See*—
Kiyama, Torao; and Kiyama, Satoshi, 4,254,515, Cl. 4-449.000.
Kiyama, Torao; and Kiyama, Satoshi. Compost-type toilet equipment. 4,254,515, Cl. 4-449.000.
Klaessig, Frederick C.; and Jacques, Donald F., to Betz Laboratories, Inc. Polyacrylic acids and methyl vinyl ether/maleic anhydride copolymers as soft scale inhibitors. 4,255,309, Cl. 260-29.6WB.
Kleemann, Manfred: *See*—
Forster, Siegfried; and Kleemann, Manfred, 4,254,827, Cl. 165-166.000.
Klein, Jurgen: *See*—
Gappa, Gunther; Juntgen, Harald; Klein, Jurgen; and Schulz, Peter, 4,255,072, Cl. 406-89.000.
Klein, Manfred: *See*—
Hennig, Kurt; and Klein, Manfred, 4,254,531, Cl. 15-256.500.
Klose, Hans J.: *See*—
Schuss, Werner; Klose, Hans J.; and Landgraf, Hermann, 4,255,143, Cl. 433-126.000.
Kluge, Arthur F.; Strosberg, Arthur M.; and Unger, Stefan H., to Syntex (U.S.A.) Inc. 8-[2-3-Indolyl)ethyl]-1-oxa-3-,8-diazaspiro[4.5]decan-2-ones, pharmaceutical compositions thereof and methods of use thereof. 4,255,432, Cl. 424-267.000.
Knauer, Karl, to Siemens Aktiengesellschaft. Input charge corrected monolithically integrated charge transfer device (CTD) arrangement. 4,255,673, Cl. 307-221.00D.
Knop, Hans-Georg; and Hoffrichter, Ingo, to Rudolf Hell GmbH. Apparatus for mixing image signals to obtain a printing master. 4,255,761, Cl. 358-80.000.
Knop, Karl H., to RCA Corporation. Diffractive color filter. 4,255,019, Cl. 350-162.0SF.
Knops, Hans-Joachim; Brandes, Wilhelm; and Paul, Volker, to Bayer Aktiengesellschaft. Combating fungi with 2-aryl-5-alkyl-3,4-dioxo-1,2,5-thiazolidine-1-oxides. 4,255,437, Cl. 424-270.000.
Knorre, Helmut; Langer, Manfred; and Pohl, Gerhard, to Deutsche Gold und Silber-Scheideanstalt Vormals Roessler. Procedure for the reprocessing of used lubricating oils. 4,255,252, Cl. 208-182.000.
Knowles, Harford E. Luggage case. 4,254,850, Cl. 190-18.00A.
Kobayashi, Yoshimichi: *See*—
Natsume, Isamu; Kobayashi, Yoshimichi; and Itou, Toshinao, 4,255,466, Cl. 427-113.000.
Kobel, George B. Motorcycle sidecar apparatus. 4,254,965, Cl. 280-203.000.
Kobylinski, Thaddeus P.: *See*—
Wu, Ching-Yong; Kobylinski, Thaddeus P.; and Bozik, John E., 4,255,596, Cl. 568-860.000.
Wu, Ching-Yong; Kobylinski, Thaddeus P.; and Bozik, John E., 4,255,599, Cl. 585-319.000.
Kock, Manfred, to Akzo N.V. Production of an edible oil from crude soy oil. 4,255,346, Cl. 260-4124.000.
Kockums Industri AB: *See*—
Arnoldsson, Erik; and Bjorklund, Lars-Ake, 4,254,874, Cl. 209-3.000.
Koehler-Dayton, Inc.: *See*—
Brennan, Edward J., 4,254,924, Cl. 244-122.00R.
Koenig, Howard A.: *See*—
Wallace, Clarence W.; and Koenig, Howard A., 4,255,367, Cl. 264-45.100.
Kogler, Horst; and Goebel, Eickhart, to Gebr. Hofmann G.m.b.H. & Co., Maschinenfabrik. Apparatus for balancing of rotors. 4,254,658, Cl. 73-462.000.
Kokelenberg, Hendrik E.: *See*—
Laridon, Urbain L.; Marien, August M.; De Winter, Walter F.; and Kokelenberg, Hendrik E., 4,255,513, Cl. 430-281.000.
Koller, Walter. Card index. 4,254,567, Cl. 40-389.000.
Kolwaite, John S.: *See*—
Gerthoffer, Bernard P.; and Kolwaite, John S., 4,254,801, Cl. 138-89.000.
Komatsu, Fumito; Kudo, Yasuto; and Kamijima, Tadashi, to Kabushiki Kaisha Sankyo Seiki Seisakusho. Coupler of winding key with power spring. 4,254,856, Cl. 192-415.000.
Komatsu, Toshiyuki: *See*—
Koumura, Noboru; Komatsu, Toshiyuki; Nakagawa, Katsumi; Takekawa, Nobuhiro; and Fujii, Motoharu, 4,255,041, Cl. 355-3.00R.
Komori, Haruyuki, to Seiko Keiki Kabushiki Kaisha. Oil separator for compressor. 4,255,099, Cl. 418-97.000.
Kondo, Asaji: *See*—
Kitajima, Masao; Arai, Fuminori; and Kondo, Asaji, 4,255,384, Cl. 422-57.000.
Kondo, Ryohei, to Sankyo Electric Co., Ltd. Article storage unit devices for use in vending machines. 4,254,893, Cl. 221-124.000.
Kondo, Toshio: *See*—
Kuroda, Masao; Ono, Sekijyuro; Katakura, Kageyoshi; and Kondo, Toshio, 4,254,662, Cl. 73-626.000.
Kondoh, Sigeo: *See*—
Megumi, Takeaki; Yoshizaki, Hiroyuki; and Kondoh, Sigeo, 4,255,557, Cl. 528-196.000.
Konig, Ingo: *See*—
Bergfeld, Jost; Raasch, Marie-Luise; Konig, Ingo; and Brussow, Klaus-Peter, 4,255,420, Cl. 424-177.000.
Konishiroku Photo Industry Co., Ltd.: *See*—
Shibue, Toshiaki; Nagayasu, Koichi; Mayama, Masayoshi; Ishihara, Masao; and Abe, Naoto, 4,255,515, Cl. 430-495.000.
Konuma, Kunio: *See*—
Chiba, Shoichi; Konuma, Kunio; and Ishizaki, Hirofumi, 4,254,746, Cl. 123-52.00M.
Kooi, J. Peter E., to Keuffel & Esser Company. Theodolite center mounting means. 4,254,925, Cl. 248-180.000.
Koontz, Richard D., to F. Jos. Lamb Company. Lift and carry accumulating conveyor. 4,254,860, Cl. 198-751.000.
Kopchik, Richard M., to Rohm and Haas Company. Blends of imide polymers and vinyl chloride polymers. 4,255,322, Cl. 260-45.75K.
Koppe, Herbert; Mentrup, Anton; Renth, Ernst-Otto; Schromm, Kurt; Hoefke, Wolfgang; and Muacevic, Gojko, to Boehringer Ingelheim GmbH. 1-Aryloxy-2-hydroxy-3-[(tetrahydroquinolonylalkyl)-amino]-propanes and salts thereof. 4,255,430, Cl. 424-258.000.
Koppens, Wilhelmus F. A. Apparatus for use in the manufacture of disc-like products. 4,254,534, Cl. 17-32.000.
Koppers, Manfred; Spies, Klaus; and Bohnes, Karlheinz, to Bochumer Eisenhutte Heintzmann GmbH & Co. Supporting of excavation roofs. 4,255,071, Cl. 405-290.000.
Kordis, Joel H. Splinting device. 4,254,766, Cl. 128-87.00R.
Koren, Paul P.: *See*—
Wafer, John A.; Koren, Paul P.; and Meyer, Thomas N., 4,255,636, Cl. 200-250.000.
Korte, Siegfried: *See*—
Suling, Carlhans; Korte, Siegfried; and Neukam, Theo, 4,255,546, Cl. 526-206.000.
Kossoff, George; and Carpenter, David A., to Commonwealth of Australia, The. Ultrasonic transducer array. 4,254,661, Cl. 73-625.000.
Kosswig, Kurt: *See*—
Coenen, Alfred; Kosswig, Kurt; Von Praun, Ferdinand; and Schuller, Hans-Peter, 4,255,356, Cl. 564-499.000.
Koumura, Noboru; Komatsu, Toshiyuki; Nakagawa, Katsumi; Takekawa, Nobuhiro; and Fujii, Motoharu, to Canon Kabushiki Kaisha. Automatic printing apparatus. 4,255,041, Cl. 355-3.00R.
Kourimsky, Friedrich J. A.; and Nix, Lothar H. W., to AMP Incorporated. Electrical junction box. 4,255,004, Cl. 339-17.00E.
Kouris, Spiro. Thread dyeing kit. 4,254,645, Cl. 68-213.000.
Kowa Company, Ltd.: *See*—
Watanabe, Isamu; Iwasaki, Akio; and Mori, Toshihito, 4,255,421, Cl. 424-180.000.
Krabbe, Wilfried: *See*—
Zerna, Wolfgang; Krabbe, Wilfried; and Schafer, Hans, 4,255,366, Cl. 264-35.000.
Kraft, Karl J.: *See*—
Hoffmann, Erwin; Dietrich, Werner; and Kraft, Karl J., 4,255,105, Cl. 425-144.000.
Kraftwerk Union Aktiengesellschaft: *See*—
Goebel, Konrad, 4,255,082, Cl. 415-182.000.
Kramer, Charles F.: *See*—
Kaufmann, Frank H.; and Kramer, Charles F., 4,254,802, Cl. 139-91.000.
Kramer, George A. Game piece arrangement game device. 4,254,957, Cl. 273-271.000.
Kramer, Wolfgang; Buchel, Karl; Frohberger, Paul-Ernst; Brandes, Wilhelm; and Scheinpflug, Hans, to Bayer Aktiengesellschaft. Combatting fungi with 1-(azol-1-yl)-4-halo-(1)-phenoxy-butan-2-ones and -ols. 4,255,434, Cl. 424-269.000.
Kranz, Joachim; and Sappok, Reinhard, to BASF Aktiengesellschaft. Pigment formulations. 4,255,203, Cl. 106-288.00Q.
Kraska, Allen R., to Pfizer Inc. 1-(2-Hydroxy-3-n-alkoxypropyl)-4-substituted-piperazines and piperidines. 4,255,426, Cl. 424-250.000.
Kratos Limited: *See*—
Barrie, Andrew; and Herd, Quentin C., 4,255,656, Cl. 250-305.000.
Krauss-Maffei Aktiengesellschaft: *See*—
Ostermeyer, Peter; and Hultsch, Gunther, 4,254,904, Cl. 233-2.000.
Krautkramer-Branson, Inc.: *See*—
Prause, Reinhard, 4,254,660, Cl. 73-597.000.
Krbechek, Leroy O., to Henkel Corporation. Steroid production. 4,255,345, Cl. 260-397.100.
Krenzer, John, to Velsicol Chemical Corporation. Aminosulfonylthiadiazolylureas. 4,255,182, Cl. 71-90.000.

Krieg, John J.; and Hillebrand, George A., to Eaton Corporation. Fuel injection system and timing advance device therefor. 4,254,749, Cl. 123-502.000.

Krings, Peter: *See*—
Reinwald, Elmar; Schwuger, Milan J.; Smolka, Heinz; and Krings, Peter, 4,255,148, Cl. 8-137.000.

Krisch, Ernst; Meister, Jorg; and Moser, Josef, to BBC Brown Boveri & Company Limited. Salient pole for an electric machine. 4,255,683, Cl. 310-214.000.

Kroon, David H.; Bushman, James B.; and Rog, Joseph W. Cathodic protection apparatus and method for steel reinforced concrete structures. 4,255,241, Cl. 204-147.000.

Kropp, Rudolf, to Degussa Aktiengesellschaft. Gold-silver alloys with good tarnish resistance for the dental art. 4,255,191, Cl. 75-134.00N.

Kruger, Friedrich; and Michel, Walter. N,N-Dialkylureidomethane diphosphonic acid and its preparation. 4,255,572, Cl. 544-243.000.

Krutsch, John R.: *See*—
Bubley, Henry J.; Krutsch, John R.; and Oltra, Claude H., 4,254,708, Cl. 101-123.000.

Kubota, Naohiro: *See*—
Minagawa, Motonobu; Nakahara, Yutaka; and Kubota, Naohiro, 4,255,301, Cl. 260-18.0TN.

Kubota, Yukio, to Sony Corporation. Tracking control apparatus for a rotary head, variable speed signal reproducing system. 4,255,768, Cl. 360-10.000.

Kubota, Yukio, to Sony Corporation. Video signal reproducing apparatus. 4,255,771, Cl. 360-77.000.

Kuch, Philip L.; and Herrington, Daniel R., to Standard Oil Company, The. Process for making indene. 4,255,601, Cl. 585-411.000.

Kucheck, Leo; and Crankshaw, Michael, to Label-Aire Inc. Method for supplying a label to an article surface. 4,255,220, Cl. 156-285.000.

Kudo, Yasuto: *See*—
Komatsu, Fumito; Kudo, Yasuto; and Kamijima, Tadashi, 4,254,856, Cl. 192-415.000.

Kudo, Yoshihiko: *See*—
Nomoto, Kohki; and Kudo, Yoshihiko, 4,255,401, Cl. 423-235.000.

Kuehl, Gregory W.: *See*—
Rohan, Joseph J.; and Kuehl, Gregory W., 4,255,745, Cl. 340-546.000.

Kuehler, Christopher W.: *See*—
Rosenthal, Joel W.; Dahlberg, Arthur J.; and Kuehler, Christopher W., 4,255,248, Cl. 208-8.0LE.

Kuehlhorn, Bert O. Carton structure. 4,254,903, Cl. 229-45.00R.

Kuehnle, Manfred R., to Coulter Systems Corporation. Flexible metal printing cylinder having a coating of crystalline photoconductive material. 4,255,508, Cl. 430-94.000.

Kuether, Christian L.; Williams, Robert E.; Decker, Thomas A.; Kurtzman, Charles; Richardson, Kenneth T.; and Harrison, Richard A., to Baylor College of Medicine. Method of and apparatus for examination of visual fields. 4,255,022, Cl. 351-24.000.

Kugisawa, Toshio; and Sakashita, Noriji, to Kabushiki Kaisha Kawai Gakki Seisakusho. Musical waveshape processing system. 4,254,681, Cl. 84-1.010.

Kuhnel, Werner; and Spielau, Paul, to Dynamit Nobel Aktiengesellschaft. Process for the production of foam materials on polyolefin basis. 4,255,372, Cl. 264-54.000.

Kuhnel, Werner: *See*—
Hederich, Volker; Gehrke, Gunter; Kuth, Robert; and Kuhnel, Werner, 4,255,151, Cl. 8-532.000.

Kumagai, Taiji: *See*—
Nakamura, Yoshiyuki; Matsubara, Seiichi; Matsui, Takashi; Kumagai, Taiji; Senga, Taizo; and Fukutsu, Tsutomu, 4,255,184, Cl. 75-10.00R.

Kumandan, Krishna R., to Hughes Company, Inc. Declusterer disc assembly. 4,254,702, Cl. 99-638.000.

Kuniya, Keiichi: *See*—
Arakawa, Hideo; Kuniya, Keiichi; and Ohashi, Masabumi, 4,254,548, Cl. 29-879.000.

Kunkel, Heinrich: *See*—
Olschewski, Armin; Walter, Lothar; Brandenstein, Manfred; Kunkel, Heinrich; and Norlander, Gosta, 4,255,000, Cl. 308-8.200.

Kureha Kagaku Kogyo Kabushiki Kaisha: *See*—
Nomoto, Kohki; and Kudo, Yoshihiko, 4,255,401, Cl. 423-235.000.

Kuroda, Masao; Ono, Sekijyuro; Katakura, Kageyoshi; and Kondo, Toshio, to Hitachi Medical Corporation. Multiple acoustic beamformer step scanner. 4,254,662, Cl. 73-626.000.

Kurosawa, Takuzo; Dewa, Seiki; Kikuchi, Yuzuru; and Kanamaru, Hisanobu, to Hitachi, Ltd. Fluid-operated press. 4,255,113, Cl. 425-411.000.

Kurtzman, Charles: *See*—
Kuether, Christian L.; Williams, Robert E.; Decker, Thomas A.; Kurtzman, Charles; Richardson, Kenneth T.; and Harrison, Richard A., 4,255,022, Cl. 351-24.000.

Kurz, Arthur W.: *See*—
Aikens, William R.; and Kurz, Arthur W., 4,254,931, Cl. 248-549.000.

Kurzhals, Hans-Albert: *See*—
Roselius, Ludwig; Kurzhals, Hans-Albert; and Hubert, Peter, 4,255,458, Cl. 426-424.000.

Kuth, Robert: *See*—
Hederich, Volker; Gehrke, Gunter; Kuth, Robert; and Kuhnel, Werner, 4,255,151, Cl. 8-532.000.

Kutsch-Consult GmbH: *See*—
Jung, Hermann; and Spennes, Gunter (said Gunter Spennes assors. to), 4,255,389, Cl. 422-209.000.

Kuwabara, Shigeru: *See*—
Suzuki, Teruo; and Kuwabara, Shigeru, 4,255,136, Cl. 432-143.000.

Kyker, Glendon D.: *See*—
Paul, Kalidas; and Kyker, Glendon D., 4,255,597, Cl. 570-220.000.

Kyoshin Co., Ltd.: *See*—
Shibanai, Ichiro; Horikoshi, Kouki; and Nakamura, Nobuyuki, 4,255,249, Cl. 208-11.00R.

Kyowa Hakko Kogyo Co., Ltd.: *See*—
Terada, Osamu; Uwajima, Takayuki; and Akita, Hiroko, 4,255,519, Cl. 435-190.000.

La Rochette-Cenpa: *See*—
Gauthier, Jean, 4,254,680, Cl. 83-665.000.

Laas, Harald: *See*—
Opgenorth, Hans-Joachim; Scheuermann, Horst; Laas, Harald; and Nissen, Axel, 4,255,333, Cl. 260-319.100.

Label-Aire Inc.: *See*—
Kucheck, Leo; and Crankshaw, Michael, 4,255,220, Cl. 156-285.000.

Laboratories Bago, S.A.: *See*—
Los, Mario A., 4,255,581, Cl. 546-269.000.

Ladanyi, Csaba. Orthodontic appliance. 4,255,139, Cl. 433-21.000.

Laforest nee Boutillier du Retail, Jacqueline S.: *See*—
Thuillier nee Nachmias, Germaine; Laforest nee Boutillier du Retail, Jacqueline S.; Cariou, Bernard J. M.; Bessin, Pierre A. R.; Bonnet nee Roux, Jacqueline S.; and Thuillier, Jean E., 4,255,585, Cl. 549-58.000.

LaHaye, Paul G.; Bjerklie, John W.; Most, Ivan G.; and Hagen, Kenneth G., to Hague International. Solid fuel combustor and method of burning. 4,254,715, Cl. 110-300.000.

Laing, Joseph T., to United States of America, Navy. Underwater-target direction-finding apparatus. 4,255,799, Cl. 367-96.000.

Lala, Louis A., to American Screen Printing Equipment Company. Accessory for printing oval objects. 4,254,706, Cl. 101-38.00R.

Lambert, Daryl G.; Sage, Howard M.; and Ester, Lee W., to Itron, Inc. Screen printing apparatus with screen peel-off from work. 4,254,707, Cl. 101-123.000.

Lambert, Ralph G., to Drutan Products, Inc. Cleaning and washing pad. 4,254,530, Cl. 15-235.000.

Lambrechtse, Cornelis W.: *See*—
Boonstra, Lieuwe; Lambrechtse, Cornelis W.; Salters, Roelof H. W.; and Wijnhoven, Rene M. G., 4,255,677, Cl. 307-304.000.

Lamparsky, Dietmar: *See*—
Kaiser, Roman; and Lamparsky, Dietmar, 4,255,337, Cl. 260-346.110.

Lamport, Ivan R.: *See*—
Kessinger, Orville E.; and Lamport, Ivan R., 4,254,668, Cl. 74-572.000.

Lamprecht, Josef: *See*—
Oppenlaender, Knut; Strickler, Rainer; Geelhaar, Hans J.; Lamprecht, Josef; Penzel, Erich; and Ley, Gregor, 4,255,310, Cl. 260-29.60T.

Landgraf, Hermann: *See*—
Schuss, Werner; Klose, Hans J.; and Landgraf, Hermann, 4,255,143, Cl. 433-126.000.

Landry, Jean-Guy. Cover for use on a toaster. 4,254,695, Cl. 99-334.000.

Lane, Alan J.: *See*—
McGee, Dean A.; Ingle, James E.; and Lane, Alan J., 4,254,993, Cl. 299-10.000.

Lang-Ree, Nils; Brown, John S.; and Baker, Edward D., to NPI Corporation. Broiler with a patty feed. 4,254,697, Cl. 99-387.000.

Lang, Walter W.: *See*—
Wafer, John A.; Bratkowski, Walter V.; and Lang, Walter W., 4,255,732, Cl. 335-16.000.

Lang, Wilhelm-Ludwig, to VDO Adolf Schindling AG. Device for the indication of different operating conditions of motor vehicles. 4,255,739, Cl. 340-52.00F.

Lange, Karl-Heinz, to Balda-Werke Photgraphische Gerate und Kunstosoff GmbH & Co., KG. Ring element for camera mechanism. 4,255,035, Cl. 354-230.000.

Langer, Alois A., to Mirowski, Mieczyslaw. Implantable defibrillator and package therefor. 4,254,775, Cl. 128-419.00D.

Langer, Manfred: *See*—
Knorre, Helmut; Langer, Manfred; and Pohl, Gerhard, 4,255,252, Cl. 208-182.000.

Langlitz, Karlheinz; and Schmitz, Gunter, to Mannesmann Demag A.G. Metallurgical vessel handling vehicle. 4,254,711, Cl. 105-177.000.

Langlois, Etienne: *See*—
Ernyei, Herbert; and Langlois, Etienne, 4,255,727, Cl. 333-197.000.

Laridon, Urbain L.; Marien, August M.; De Winter, Walter F.; and Kokelenberg, Hendrik E., to AGFA-GEVAERT N.V. Photopolymerizable recording materials. 4,255,513, Cl. 430-281.000.

Larionov, Valentin N.: *See*—
Kalinin, Viktor P.; Avdjukhin, Sergei P.; Lebedev, Vsevolod I.; Zhilin, Viktor F.; Frolov, Vladimir S.; Anisimov, Jury V.; Slavin, Jury T.; and Larionov, Valentin N., 4,255,373, Cl. 264-65.000.

LaRocque, Arthur G.: *See*—
Johnson, Bruce K.; Whiteside, George D.; and LaRocque, Arthur G., 4,255,031, Cl. 354-53.000.

Larson, Eric R.: *See*—
Wingard, Robert E., Jr.; and Larson, Eric R., 4,255,548, Cl. 526-310.000.

Larsson, Kenneth: *See*—
Smedberg, Olle; and Larsson, Kenneth, 4,255,102, Cl. 425-74.000.

Laurel Bank Machine Co., Ltd.: *See*—
Watanabe, Kenkichi; and Furuya, Katusuke, 4,254,787, Cl. 133-8.00A.
Lawrence, Charles T., to Textron, Inc. Slide fastener installation and method of making the same. 4,254,538, Cl. 24-205.00R.
Layciak, Stephen G.: *See*—
Johnston, Robert J.; Layciak, Stephen G.; and Cametti, George M., 4,255,633, Cl. 200-153.00J.
Layne-Western Company, Inc.: *See*—
Nuzman, Carl E., 4,254,831, Cl. 166-245.000.
Lazarchuk, Roman. Work table locating device. 4,254,670, Cl. 74-815.000.
Lazzara, Frederick: *See*—
Rudy, Jerome; Lazzara, Frederick; Cowles, Warren W.; and Cahn, Arno, 4,255,294, Cl. 252-524.000.
Lebedev, Vsevolod I.: *See*—
Kalinin, Viktor P.; Avdjukhin, Sergei P.; Lebedev, Vsevolod I.; Zhilin, Viktor F.; Frolov, Vladimir S.; Anisimov, Jury V.; Slavin, Jury T.; and Larionov, Valentin N., 4,255,373, Cl. 264-65.000.
Lebrun, Henri V.; and Boutboul, Pierre A. Mobile spraying apparatus for watering cultivated surfaces. 4,254,912, Cl. 239-183.000.
Lechner, Hilmar: *See*—
Schoettle, Klaus; Muenzner, Wulf; Lechner, Hilmar; Woeppel, Dieter; and Gliniorz, Lothar, 4,254,585, Cl. 51-5.00A.
Lecornet, Jean-Claude, to Thomson-CSF. Cathode heating apparatus for an electronic power tube. 4,255,690, Cl. 315-106.000.
Lee, Stuart A. Vending machine shelf wideners. 4,254,892, Cl. 221-90.000.
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Zeitzoff, Peter M.; Lee, Teh-Hsuang; Burkey, Bruce C.; Khosla, Rajinder P.; and Kelly, Thomas M., 4,255,760, Cl. 358-41.000.
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Maule, Warren. Phonograph record holder with locking means. 4,254,879, Cl. 211-4.000.
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McCready, James F.; Bookwalter, John R.; Downing, Roy W.; and Guay, George W., to Codman & Shurtleff, Inc. Surgical retractor assembly. 4,254,763, Cl. 128-20.000.
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Byrd, Norman R.; and Donahoe, John K., 4,255,483, Cl. 428-245.000.
McFarlane, James D.: *See*—
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McGinness, Patrick J., to Hughes Aircraft Company. Process for selectively applying a conformal coating with a masking tape having an imbedded wire cutting edge. 4,255,469, Cl. 427-282.000.
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Medex Inc.: *See*—
Waldbillig, Charles C., 4,254,773, Cl. 128-348.000.
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Megna, Salvatori G.; and Pracht, Gunther, to "Jaguar" Stahlwaren Vertriebsgesellschaft mbH & Co. Scissors-like tool. 4,254,551, Cl. 30-341.000.
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Mentrup, Anton: *See*—
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Christensen, Burton G.; and DiNinno, Frank P., 4,255,330, Cl. 260-239.100.
Hannah, John, 4,255,424, Cl. 424-248.510.

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Branlard, Paul; and Merle, Jean-Pierre, 4,255,539, Cl. 525-330.000.

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Sowa, Armin; and Munding, German, 4,254,828, Cl. 166-63.000.
Wackerle, Peter M.; Brunsch, Klaus; and Grober, Josef, 4,255,087, Cl. 416-230.000.

Metallwerk Max Brose GmbH: *See*—
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Sonderegger, Hans C.; and Meyer, Urs B., 4,255,163, Cl. 51-169.000.

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Thekdi, Arvind C., 4,255,128, Cl. 432-5.000.

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Miller, Harold N.; Wisotsky, Max J.; and Rhodes, Richard P., to Exxon Research & Engineering Co. Polymer combinations useful in fuel oil to improve cold flow properties. 4,255,159, Cl. 44-62.000.

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Miller, James R., to B. F. Goodrich Company, The. Reducing residual acrylonitrile in water dispersions of acrylonitrile polymers with alkali or ammonium sulfite. 4,255,307, Cl. 260-29.6PT.

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Casey, Gary L.; Blatter, Albert; Miller, John A.; and Claxton, William B., 4,254,653, Cl. 73-3.000.

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Miller, Robert A.: *See*—
Levine, Stanley R.; Miller, Robert A.; and Hodge, Philip E., 4,255,495, Cl. 428-632.000.

Miller, Robert C., to Westinghouse Electric Corp. Electrical energy meter. 4,255,707, Cl. 324-142.000.

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Mims, Matlock M., to Bergeron, Gregory; and Heiner, Robert J. Apparatus and method for alleviating physiological conditions by directed spray of liquid toward body tissue. 4,254,770, Cl. 128-229.000.

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Minami, Michio: *See*—
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Tanie, Kazuo; and Tachi, Susumu, 4,254,776, Cl. 128-421.000.

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Giorgini, Norman L.; and Ulseth, John W., 4,255,650, Cl. 235-91.00R.
Stageberg, Wilfred E., 4,255,218, Cl. 156-238.000.

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Inagaki, Tetsuhiko; and Imura, Toshinori, 4,255,691, Cl. 315-241.00P.

Miranti, Joseph P., Jr., to Dayco Corporation. Wrapped-molded V-belt and method of manufacture. 4,255,147, Cl. 474-262.000.

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Langer, Alois A., 4,254,775, Cl. 128-419.00D.

Mischler, William R.; and General Electric Company. Laminated motor stator structure with molded composite pole pieces. 4,255,684, Cl. 310-216.000.

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Mitchell, David C. Arrangement for coupling vehicles. 4,254,966, Cl. 280-405.00R.

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Imada, Yukio and Mizuno, Sumiko, 4,255,344, Cl. 260-397.100.
Natsume, Isamu; Kobayashi, Yoshimichi; and Itou, Toshinao, 4,255,466, Cl. 427-113.000.

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Onooka, Yasushi, 4,255,770, Cl. 360-69.000.
Shimotori, Kazuhiro; Nakano, Takao; and Nagayama, Yasuzi, 4,255,756, Cl. 357-51.000.
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Kawai, Yoshio; Kida, Koichi; Ikarashi, Hideo; Toki, Tsukasa; and Suzuki, Yoshiharu, 4,255,592, Cl. 568-573.000.
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Aoki, Toshio; Takayama, Atsumi; Matsuuchi, You; Baba, Mikito; and Kawazoe, Kenichiro, 4,254,665, Cl. 74-10.330.

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Mixon, James L., Jr. Laboratory device for small animals. 4,254,767, Cl. 128-216.000.

Miya, Masayoshi: *See*—
Sakurai, Hisaya; Morita, Hideo; Miya, Masayoshi; Takaya, Katsuhiko; and Yoneda, Haruyuki, 4,255,280, Cl. 252-429.00B.

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Miyake, Hideo: *See*—
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Miyake, Tetsuya; Inada, Kohji; and Asano, Motohisa, to Asahi Kasei Kogyo Kabushiki Kaisha. Separation of C_8 aromatic isomers. 4,255,607, Cl. 585-805.000.
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Miyamoto, Noriaki; Shiraki, Masao; and Mitsuya, Kinpei, to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho. Device for supporting a spindle of an open-end spinning frame. 4,254,614, Cl. 57-58.890.
Miyata, Seiji; Akagawa, Masatake; Yamamoto, Masahiro; and Inoue, Noboru, to Asahi Medical Co., Ltd. Brain wave analysis apparatus for use in diagnosing living body conditions. 4,254,779, Cl. 128-731.000.
Miyazaki, Seiichi, to Ohkura Electric Co., Ltd. Dicode transmission system. 4,255,813, Cl. 375-34.000.
Miyoshi, Shigeto; and Kagami, Toshio, to Denki Kagaku Kogyo Kabushiki Kaisha. Method for the manufacture of a vinyl chloride copolymer solution. 4,255,314, Cl. 260-32.80R.
Mizote, Masanori, to Nissan Motor Company, Limited. Method and apparatus for measuring air quantity in relation to engine speed. 4,254,744, Cl. 123-480.000.
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Mizuno, Kiyofumi; Sato, Masanori; Maeda, Hiroaki; Takahashi, Shigeo; and Suzuki, Satomi, to Aisin Seiki Kabushiki Kaisha. Control system for a stepless variable speed transmission. 4,254,672, Cl. 74-869.000.
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Butter, Stephen A.; and Chester, Arthur W., 4,255,349, Cl. 260-449.60R.
Horodysky, Andrew G.; and Gemmill, Robert M., Jr., 4,255,271, Cl. 252-46.700.
Young, L. Brewster, 4,255,600, Cl. 585-362.000.
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Modern Suspension Systems, Inc.: *See*—
Hager, Clarence H., 4,254,532, Cl. 16-20.000.
Moeller, Kurt G. F. Shock-crush subfoundation. 4,254,727, Cl. 114-65.00R.
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Mohring, Edgar; Muller, Hanns P.; and Wagner, Kuno, to Bayer Aktiengesellschaft. Process for the preparation of cellular or non-cellular polyurethane resins. 4,255,529, Cl. 521-158.000.
Mohrke, Helmut: *See*—
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Molnar, Charles J.; Price, Edward H.; and Resnick, Paul R., to Du Pont de Nemours, E. I., and Company. Ion-exchange structures of copolymer blends. 4,255,240, Cl. 204-98.000.
Monsanto Company: *See*—
Fields, Joseph E.; Asculai, Samuel S.; and Johnson, John H., 4,255,537, Cl. 525-328.000.
Houbion, John A.; and Dayawon, Miguel W., 4,255,181, Cl. 71-88.000.
Makin, Earle C.; Price, Jerry L.; and Wei, Yu W., 4,255,591, Cl. 562-517.000.
Tremont, Samuel J.; and Williamson, Alex N., 4,255,602, Cl. 585-428.000.
Williams, Louis B., Jr., 4,255,472, Cl. 427-445.000.
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Williamson, Alex N.; and Tremont, Samuel J., 4,255,603, Cl. 585-428.000.
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Moodie, Donald E., to Polaroid Corporation. Method and apparatus for covering sealing surface on sealing device of film cassette processor. 4,255,025, Cl. 352-130.000.
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Moore, James W., to Deere & Company. Low noise producing lawn mower blade. 4,254,607, Cl. 56-295.000.
Morcom, William R.; Nicolay, Hugh C.; and Cox, Eugene R., to Harris Corporation. Process of fabricating an improved I^2L integrated circuit utilizing diffusion and epitaxial deposition. 4,255,209, Cl. 148-175.000.
Morcom, William R., to Harris Corporation. Method of reworking PROMS. 4,255,229, Cl. 156-628.000.
Moreaud, Henri; Gilles, Pierre; and Leglise, Jean-Paul, to O T V (Omnium de Traitements et de Valorisation). Water purification process. 4,255,266, Cl. 210-614.000.
Morgan, Charles W., to Science Union et Cie Societe Francaise de Recherche Med. Method for manufacturing flat top foam buns. 4,255,370, Cl. 264-51.000.
Morgan, Steven R.; and Reese, Dwayne E. Ball throwing machine useful in practicing the game of volleyball. 4,254,755, Cl. 124-6.000.
Mori, Toshihito: *See*—
Watanabe, Isamu; Iwasaki, Akio; and Mori, Toshihito, 4,255,421, Cl. 424-180.000.
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Morito, Nobuyuki; Sugiyama, Toshitomo; and Obata, Yoshio, to Kawasaki Steel Corporation. Method of producing grain-oriented silicon steel sheets having substantially no glass film. 4,255,205, Cl. 148-113.000.
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Morley, Edward G.: *See*—
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Morris, Lyle E.; and Sun, Kai C. K., to Xerox Corporation. Power amplifier with power monitor circuit. 4,255,694, Cl. 318-565.000.
Morris, Robert L.: *See*—
Scotese, Anthony C.; Morris, Robert L.; and Santilli, Arthur A., 4,255,568, Cl. 544-91.000.
Morrison-Knudsen Forest Products Company, Inc.: *See*—
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Morrison, Robert W., Jr.; Mallory, William R.; and Styles, Virgil L., to Burroughs Wellcome Co. Substituted pyrimido (4,5-c)pyridazines. 4,255,427, Cl. 424-251.000.
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Moser, Rabin, to Xerox Corporation. Roll fuser apparatus and release agent metering system therefor. 4,254,732, Cl. 118-60.000.
Moss, Gerald, to Exxon Research and Engineering Co. Integrated process for converting sulfur-containing fuels to low sulfur combustible gas. 4,255,162, Cl. 48-197.00R.
Moss, Mark D., to Hedstrom Co. Sprocket-actuated brake. 4,254,848, Cl. 188-24.000.
Moss, Richard D.: *See*—
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Sumiyoshi, Masaharu; Sekiya, Setsuro; and Motosugi, Katsuhiko, 4,254,747, Cl. 123-52.00M.
Mouille, Rene L.; Genoux, Gerard C. L.; Declercq, Marc A.; Leman, Jean-Luc M.; and Suzzi, Robert J., to Societe Nationale Industrielle et Aerospatiale. Device for damping the vibrations of a rotary-wing aircraft rotor. 4,255,084, Cl. 416-145.000.
Muacevic, Gojko: *See*—
Koppe, Herbert; Mentrup, Anton; Renth, Ernst-Otto; Schromm, Kurt; Hoefke, Wolfgang; and Muacevic, Gojko, 4,255,430, Cl. 424-258.000.
Muck, Gerhard: *See*—
Peter, Kurt; and Muck, Gerhard, 4,254,571, Cl. 42-89.000.
Muenzner, Wulf: *See*—
Schoettle, Klaus; Muenzner, Wulf; Lechner, Hilmar; Woeppel, Dieter; and Gliniorz, Lothar, 4,254,585, Cl. 51-5.00A.
Muller, Eckart, to Maschinenfabrik Augsburg-Nurnberg Aktiengesellschaft. Fuel injector for internal combustion engines. 4,254,915, Cl. 239-533.120.
Muller, Eckhardt. Hulls for sea vessels. 4,254,729, Cl. 114-280.000.
Muller, Hanns P.: *See*—
Mohring, Edgar; Muller, Hanns P.; and Wagner, Kuno, 4,255,529, Cl. 521-158.000.

Muller, Hans-Jurgen; Hombach, Rudolf; Dollhausen, Manfred; and Zirner, Joachim, to Bayer Aktiengesellschaft. Process for the production of isocyanurate polyisocyanates, and products by the process. 4,255,569, Cl. 544-193.000.

Muller, Werner C.; and Miller, Franklyn D., to National Distillers and Chemical Corp. Process for the recovery of starch from cereal grains as an aqueous slurry. 4,255,518, Cl. 435-161.000.

Muller, Werner H., to Hoechst Aktiengesellschaft. Catalytic dehydrogenation preparation of 3-pyridazones. 4,255,571, Cl. 544-239.000.

Mullins, James R.: *See*—
Fales, Gene T.; and Mullins, James R., 4,254,866, Cl. 206-320.000.

Munding, German: *See*—
Sowa, Armin; and Munding, German, 4,254,828, Cl. 166-63.000.

Murakami, Hirokuni; and Horii, Hiroshi, to Matsushita Electric Industrial Co., Ltd. Control apparatus for an air conditioner. 4,254,633, Cl. 62-155.000.

Murata Manufacturing Co., Ltd.: *See*—
Ogawa, Toshio, 4,255,272, Cl. 252-62.900.

Murray, David. Combination cardiovascular electronic display/teaching apparatus, system and methods of constructing and utilizing same. 4,254,562, Cl. 434-267.000.

Murray, Myles N., to Industrial Electronic Rubber Co. Method of manufacturing cable seals. 4,255,479, Cl. 428-131.000.

Mussinan, Cynthia J.; Mookherjee, Braja D.; Vock, Manfred H.; Schmitt, Frederick L.; Shuster, Edward J.; Sanders, James M.; Light, Bette M.; and Granda, Edward J., to International Flavors & Fragrances Inc. Terpinyl methyl ether. 4,255,460, Cl. 426-538.000.

Mussinan, Cynthia J.: *See*—
Withycombe, Donald A.; Mookherjee, Braja D.; Mussinan, Cynthia J.; Vock, Manfred H.; and Giacino, Christopher, 4,255,583, Cl. 548-146.000.

Mustang Tripsaver Inc.: *See*—
Jones, Kenneth R., 4,254,837, Cl. 175-67.000.

N. V. Bekaert S.A.: *See*—
Haemers, Guy, 4,255,496, Cl. 428-677.000.

Nabeshima, Shigeyasu: *See*—
Hirohara, Hideo; Nabeshima, Shigeyasu; Mitsuda, Satoshi; and Nagase, Tsuneyuki, 4,255,521, Cl. 435-234.000.

Nagasawa, Hiroshi, to Tokyo Shibaura Denki Kabushiki Kaisha. Light emitter mounted on reflector formed on end of lead. 4,255,688, Cl. 313-499.000.

Nagase, Tsuneyuki: *See*—
Hirohara, Hideo; Nabeshima, Shigeyasu; Mitsuda, Satoshi; and Nagase, Tsuneyuki, 4,255,521, Cl. 435-234.000.

Nagata Seisakusho Co., Ltd.: *See*—
Tanaka, Minoru; and Harihara, Ryoji, 4,254,560, Cl. 34-12.000.

Nagayama, Yasuzi: *See*—
Shimotori, Kazuhiro; Nakano, Takao; and Nagayama, Yasuzi, 4,255,756, Cl. 357-51.000.

Nagayasu, Koichi: *See*—
Shibue, Toshiaki; Nagayasu, Koichi; Mayama, Masayoshi; Ishihara, Masao; and Abe, Naoto, 4,255,515, Cl. 430-495.000.

Nagel, Fritz J., to Chapman Chemical Company. Salts of polychlorinated phenols. 4,255,593, Cl. 568-776.000.

Nagumo, Shinichi, to Nissan Motor Company, Limited. Heat-insulating layer to prevent temperature drop of combustion gas in internal combustion engine. 4,254,621, Cl. 60-282.000.

Naito, Iori: *See*—
Mizumura, Yutaka; Naito, Iori; and Miyake, Hideo, 4,255,553, Cl. 528-93.000.

Nakagawa, Katsumi: *See*—
Koumura, Noboru; Komatsu, Toshiyuki; Nakagawa, Katsumi; Takekawa, Nobuhiro; and Fujii, Motoharu, 4,255,041, Cl. 355-3.00R.

Nakagawa, Satoru: *See*—
Tanaka, Minoru; Hashizume, Genzo; Matsui, Hiroshi; and Nakagawa, Satoru, 4,255,398, Cl. 423-117.000.

Nakahara, Yutaka: *See*—
Minagawa, Motonobu; Nakahara, Yutaka; and Kubota, Naohiro, 4,255,301, Cl. 260-18.0TN.

Nakajima, Kazuyoshi: *See*—
Onoda, Makoto; and Nakajima, Kazuyoshi, 4,254,588, Cl. 51-291.000.

Nakamura, Michiyuki, to United States of America, Energy. Apparatus for generating nonlinear pulse patterns. 4,255,793, Cl. 364-701.000.

Nakamura, Nobuyuki: *See*—
Shibanai, Ichiro; Horikoshi, Kouki; and Nakamura, Nobuyuki, 4,255,249, Cl. 208-11.00R.

Nakamura, Yoshiharu, to Nissan Motor Company, Limited. Multi-piece roof finisher for a vehicle. 4,254,986, Cl. 296-210.000.

Nakamura, Yoshiyuki; Matsubara, Seiichi; Matsui, Takashi; Kumagai, Taiji; Senga, Taizo; and Fukutsu, Tsutomu, to Japan Metals & Chemicals Co., Ltd. Method and apparatus for refining ferrosilicon. 4,255,184, Cl. 75-10.00R.

Nakano, Takao: *See*—
Shimotori, Kazuhiro; Nakano, Takao; and Nagayama, Yasuzi, 4,255,756, Cl. 357-51.000.

Nakashima, Shozi: *See*—
Katoh, Kazunobu; Fujita, Saburo; Otaki, Toshihiro; and Nakashima, Shozi, 4,255,516, Cl. 430-533.000.

Nakayama, Kenji, to Nippon Electric Co., Ltd. Digital filter. 4,255,794, Cl. 364-724.000.

Nakazawa, Yukio: *See*—
Ishida, Toshihiko; Nakazawa, Yukio; Shiba, Haruo; and Tanaka, Kimio, 4,254,923, Cl. 242-199.000.

Nalco Chemical Company: *See*—
Hurlock, John R.; and Goretta, Louis A., 4,255,545, Cl. 526-201.000.
Rende, Dominic S.; and Cosper, David R., 4,255,233, Cl. 162-73.000.

Namiki, Ryoichi, to Ricoh Company, Ltd. Fixing device. 4,254,733, Cl. 118-60.000.

Napier, Barton K., to Nash Manufacturing, Inc. Method of constructing a water ski foot support. 4,255,369, Cl. 264-46.600.

Naruse, Kazumichi: *See*—
Takada, Shigetaka; Okamura, Masayuki; Naruse, Kazumichi; and Watanabe, Yukihiro, 4,254,754, Cl. 123-437.000.

Nash Manufacturing, Inc.: *See*—
Napier, Barton K., 4,255,369, Cl. 264-46.600.

Nashua Corporation: *See*—
Cormier, Raymond G.; Davis, Austin; Guiguizian, Jacques; Lutz, Leo O.; and Pauk, Henry T., 4,255,044, Cl. 355-15.000.

National Can Corporation: *See*—
Proctor, Harry P., 4,254,652, Cl. 72-467.000.

National Distillers and Chemical Corp.: *See*—
Muller, Werner C.; and Miller, Franklyn D., 4,255,518, Cl. 435-161.000.

National Semiconductor Corporation: *See*—
Sauer, Don R.; and Cocke, William A., 4,255,815, Cl. 455-143.000.

Natsume, Isamu; Kobayashi, Yoshimichi; and Itou, Toshinao, to Mitsubishi Chemical Industries, Limited. Carbon electrode and manufacture thereof. 4,255,466, Cl. 427-113.000.

Naugle, Richard L., to GTE Laboratories Incorporated. Sensing apparatus. 4,255,669, Cl. 307-131.000.

Naumann, Peter: *See*—
Leichnitz, Kurt; and Naumann, Peter, 4,254,657, Cl. 73-421.50R.

Naumenko, Nikolai N.: *See*—
Zatsepin, Nikolai N.; Siljuk, Viktor F.; Malko, Ivan I.; Kaloshin, Valentin A.; Aniskovich, Valery M.; Naumenko, Nikolai N.; and Perfiliev, Vladimir V., 4,255,709, Cl. 324-229.000.

Nawn, George H.; and Rickter, Donald O., to Polaroid Corporation. Photographic processes and products. 4,255,512, Cl. 430-219.000.

Naylor, Thomas K.; and Cavigelli, George A., to American Optical Corporation. Low-noise preamplifier. 4,255,769, Cl. 360-65.000.

Necchi Societa per Azioni: *See*—
Bianchi, Nereo, 4,254,720, Cl. 112-158.00E.

Needes, Christopher R. S.; and Rellick, Joseph R., to Du Pont de Nemours, E. I., and Company. Air-fireable conductor composition. 4,255,291, Cl. 252-578.000.

Nelson, Charles W., to Apollo Hair Systems, Inc. Method and apparatus for attaching a hair unit. 4,254,784, Cl. 132-53.000.

Nelson, David R.: *See*—
Anderson, Gordon H.; Nelson, David R.; and Fetterly, Richard T., 4,254,586, Cl. 51-163.100.

Nelson, Henry R. Lubricator-loader for firearms. 4,254,572, Cl. 42-90.000.

Neoloy Products, Inc.: *See*—
Prosen, Emil M., 4,255,190, Cl. 75-134.00C.

Netto, Eduardo D. L. C. Mold for injection molding. 4,254,933, Cl. 249-103.000.

Neukam, Theo: *See*—
Suling, Carlhans; Korte, Siegfried; and Neukam, Theo, 4,255,546, Cl. 526-206.000.

Neuner, James A.; and Oates, Robert M., to Westinghouse Electric Corp. Automatic flux mapping system. 4,255,234, Cl. 176-19.00R.

Nevamar Corporation: *See*—
Scher, Herbert I.; and Ungar, Israel S., 4,255,480, Cl. 428-208.000.

New Castle Industries, Inc.: *See*—
Frankland, James D., Jr., 4,255,379, Cl. 264-328.170.

New Jersey Drilling Co., Inc.: *See*—
McBride, Donald J., 4,254,994, Cl. 299-12.000.

New World Business Corporation: *See*—
Hasebe, Nobuyasu, 4,255,400, Cl. 423-235.000.

Neward, Theodore C. Clip electrode. 4,254,764, Cl. 128-642.000.

Newton, David W.; and Gibilisco, John M., to Valleylab, Inc. Liquid pumping system having means for detecting gas in the pump. 4,255,088, Cl. 417-1.000.

Nguyen, Xuan T., to Domtar Inc. Turbulent transport contactor and method of operation. 4,255,168, Cl. 55-85.000.

Nichols, Clarence M.: *See*—
Tlaker, Erich; and Nichols, Clarence M., 4,254,690, Cl. 91-433.000.

Nickol, Friedrich W.: *See*—
Fahrenschon, Kurt; and Nickol, Friedrich W., 4,255,806, Cl. 368-240.000.

Nicolay, Hugh C.; and Lucas, William G., to Harris Corporation. Fabrication of isolated regions for use in self-aligning device process utilizing selective oxidation. 4,255,207, Cl. 148-174.000.

Nicolay, Hugh C.: *See*—
Morcom, William R.; Nicolay, Hugh C.; and Cox, Eugene R., 4,255,209, Cl. 148-175.000.

Nielinger, Werner: *See*—
Meyer, Rolf-Volker; Dhein, Rolf; Fahnler, Friedrich; Michael, Dietrich; Rudolph, Hans; and Nielinger, Werner, 4,255,560, Cl. 528-339.000.

Nielsen, Richard B., to Grefco, Inc. Perlite filler. 4,255,489, Cl. 428-405.000.

Nippon Control Ind. Co., Ltd.: *See*—
Nomura, Atsushi, 4,255,094, Cl. 417-311.000.

Nippon Electric Co., Ltd.: *See*—
Nakayama, Kenji, 4,255,794, Cl. 364-724.000.

Okuyama, Yasushi; and Suzuki, Tsuyoshi, 4,255,210, Cl. 148-187.000.
Yoshida, Yasuharu, 4,255,713, Cl. 329-50.000.
Nippon Gakki Seizo Kabushiki Kaisha: *See*—
Nonaka, Terumoto; Yoshida, Takashi; and Matsuyama, Takeshi, 4,255,671, Cl. 307-446.000.
Nippon Oil Co., Ltd.: *See*—
Araki, Yoshihiko; Hara, Hajime; and Aoyama, Kazuho, 4,255,312, Cl. 260-29.70H.
Nippon Telegraph and Telephone Public Corporation: *See*—
Hoshino, Yasushi; Toida, Tooru; Tokunaga, Yukio; Tateishi, Kazuyoshi; and Takano, Rikuo, 4,255,043, Cl. 355-3.0SC.
Nippon Telegrpah and Telephone Public Corporation: *See*—
Matsuda, Hideo; Yuki, Kiyohiro; Kawade, Takashi; Adachi, Takaaki; and Hanabe, Kenichi, 4,255,766, Cl. 358-257.000.
Nippon Zeon Co. Ltd.: *See*—
Sugi, Nagatosh; and Ohishi, Tetsu, 4,255,567, Cl. 526-225.000.
Nissan Chemical Industries Limited: *See*—
Ozawa, Kiyomi; Ishii, Shigeru; Hayashi, Mamoru; Hirose, Masayoshi; and Hirata, Kiminori, 4,255,447, Cl. 424-304.000.
Nissan Motor Company, Limited: *See*—
Fukunaga, Yukio, 4,255,005, Cl. 339-17.00C.
Masaki, Kenji, 4,254,800, Cl. 137-827.000.
Mizote, Masanori, 4,254,744, Cl. 123-480.000.
Nagumo, Shinichi, 4,254,621, Cl. 60-282.000.
Nakamura, Yoshiharu, 4,254,986, Cl. 296-210.000.
Setoguchi, Takanoru; and Hidaka, Yoshiaki, 4,254,851, Cl. 191-31.000.
Nissen, Axel: *See*—
Opgenorth, Hans-Joachim; Scheuermann, Horst; Laas, Harald; and Nissen, Axel, 4,255,333, Cl. 260-319.100.
Nix, Lothar H. W.: *See*—
Kourimsky, Friedrich J. A.; and Nix, Lothar H. W., 4,255,004, Cl. 339-17.00E.
Nixdorf Computer AG: *See*—
Huellwegen, Joseph, 4,255,812, Cl. 375-4.000.
Noble, Walter J.; and Small, John W., to International Telephone and Telegraph Corporation. Lightweight composite slotted-waveguide antenna and method of manufacture. 4,255,752, Cl. 343-771.000.
Nogami, Tomoyuki, to Toyoda Jidosha Kogyo Kabushiki Kaisha. Fluid pressure control device for vehicle braking systems. 4,254,996, Cl. 303-6.00C.
Nogami, Tomoyuki, to Toyota Jidosha Kogyo Kabushiki Kaisha. Fluid pressure control device for vehicle braking systems. 4,254,997, Cl. 303-6.00C.
Noguchi, Masaaki; Tanaka, Yukiyasu; and Igarashi, Isao, to Toyota Jidosha Kogyo Kabushiki Kaisha. Two-stroke cycle gasoline engine. 4,254,745, Cl. 123-51.00B.
Nohara, Akira; Sugihara, Hirosada; and Ukawa, Kiyoshi, to Takeda Chemical Industries, Ltd. 1-Azaxanthone derivatives. 4,255,576, Cl. 546-92.000.
Nokes, Ronald W. Wedging apparatus useful for log splitting. 4,254,808, Cl. 144-193.00C.
Nomoto, Kohki; and Kudo, Yoshihiko, to Kureha Kagaku Kogyo Kabushiki Kaisha. Treatment of exhaust gas containing sulfur oxides and nitrogen oxides. 4,255,401, Cl. 423-235.000.
Nomura, Atsushi, to Nippon Control Ind. Co., Ltd. Automatic pressure holding electromagnetic pump. 4,255,094, Cl. 417-311.000.
Nonaka, Masaharu: *See*—
Tsunoda, Sachio; and Nonaka, Masaharu, 4,255,078, Cl. 415-1.000.
Nonaka, Terumoto; Yoshida, Takashi; and Matsuyama, Takeshi, to Nippon Gakki Seizo Kabushiki Kaisha. IIL Type semiconductor integrated circuit. 4,255,671, Cl. 307-446.000.
Nonoyama, Takao: *See*—
Inada, Masami; Kitamura, Kazuhiko; Ito, Shoji; Nonoyama, Takao; and Tsuji, Riichi, 4,254,938, Cl. 251-367.000.
Norfield Manufacturing Co.: *See*—
Cheak, Edward G., 4,254,895, Cl. 227-50.000.
Norlander, Gosta: *See*—
Olschewski, Armin; Walter, Lothar; Brandenstein, Manfred; Kunkel, Heinrich; and Norlander, Gosta, 4,255,000, Cl. 308-8.200.
Norris Industries, Inc.: *See*—
Dietrich, Hagen, 4,254,648, Cl. 70-380.000.
Northern Telecom Limited: *See*—
Charlebois, Leonard J.; and Kho, James K., 4,255,609, Cl. 174-41.000.
Pacey, Grant K.; Hughes, Ronald F.; Trumble, William P.; and Lukas, Helmut H., 4,254,865, Cl. 206-316.000.
Novak, Ivan: *See*—
Berek, Dusan; and Novak, Ivan, 4,255,286, Cl. 252-448.000.
Novotny, Miroslav, to Allied Chemical Corporation. Hydrogenation of halogen-containing carboxylic anhydrides. 4,255,594, Cl. 568-842.000.
Novy, Robert A.: *See*—
Steiner, Robert A.; and Novy, Robert A., 4,254,678, Cl. 83-425.300.
Nozaki, Osamu: *See*—
Wakihira, Kazuo; Kikumoto, Satoshi; Kigawa, Hiroshi; Nozaki, Osamu; and Minami, Michio, 4,255,563, Cl. 536-8.000.
NPI Corporation: *See*—
Lang-Ree, Nils; Brown, John S.; and Baker, Edward D., 4,254,697, Cl. 99-387.000.
NTN Toyo Bearing Company, Limited: *See*—
Onoda, Makoto; and Nakajima, Kazuyoshi, 4,254,588, Cl. 51-291.000.
Nudelman, Boris I.; Gadaev, Anatoly Y.; Bikbau, Marsel Y.; and Shishkin, Petr T., to Tashkentsky Nauchno-Issledovatelsky I Proektny Institut Stroitelnykh Materilov "Niistromproekt". Raw mixture for the production of cement clinker. 4,255,201, Cl. 106-106.000.
Nulman, David. Stringed electrical instrument. 4,254,683, Cl. 84-1.160.
Numata, Saburo, to Fuji Photo Optical Co., Ltd. Exposure control device for photographic camera. 4,255,027, Cl. 354-23.00D.
Nuzman, Carl E., to Layne-Western Company, Inc. Method and apparatus for restoring and maintaining underground aquifer water system. 4,254,831, Cl. 166-245.000.
O T V (Omnium de Traitements et de Valorisation): *See*—
Moreaud, Henri; Gilles, Pierre; and Leglise, Jean-Paul, 4,255,266, Cl. 210-614.000.
Oakland Plastics Corporation: *See*—
Cook, James M., III; Foy, Dennis M.; and Shuert, Lyle H., 4,254,873, Cl. 206-599.000.
Oates, Robert M.: *See*—
Neuner, James A.; and Oates, Robert M., 4,255,234, Cl. 176-19.00R.
Obata, Yoshio: *See*—
Morito, Nobuyuki; Sugiyama, Toshitomo; and Obata, Yoshio, 4,255,205, Cl. 148-113.000.
Obendorf, Johann: *See*—
Wolf, Elmar; Obendorf, Johann; and Gras, Rainer, 4,255,551, Cl. 528-45.000.
Obert, Wolfgang; and Durr, Siegfried, to Kernforschungszentrum Karlsruhe Gesellschaft mit beschrankter Haftung. Method for producing a nozzle body by electroforming. 4,255,237, Cl. 204-9.000.
Obrist, Albert, to Albert Obrist AG. Process and apparatus for screwing on a screw cap. 4,254,603, Cl. 53-490.000.
O'Cheskey, Theodore H.; and Bunker, Carroll C., to U.S. Filter Corporation. Hydraulic powered mixing apparatus. 4,255,262, Cl. 210-221.200.
Ochii, Kiyofumi: *See*—
Suzuki, Yasoji; Ochii, Kiyofumi; and Asahi, Hirozi, 4,255,678, Cl. 307-355.000.
Oda, Yoshio; Otouma, Hiroshi; and Endoh, Eiji, to Asahi Glass Company, Limited. Electrode. 4,255,247, Cl. 204-293.000.
Ode, Sadao; and Hatuse, Toshikazu, to Citizen Watch Co. Ltd. Electronic watch. 4,255,801, Cl. 368-1.00D.
Oezelli, Riza N.: *See*—
Christophliemk, Peter; Oezelli, Riza N.; and Tischbirek, Guenther, 4,255,549, Cl. 528-28.000.
Offshore Company, The: *See*—
Yielding, Ralph D., 4,255,069, Cl. 405-196.000.
Ogawa, Hiroshi, to Citizen Watch Company Limited. Electronic timepiece. 4,255,802, Cl. 368-69.000.
Ogawa, Masaki; and Araki, Tamio, to Bridgestone Tire Company Limited. Polybutadiene rubber composition. 4,255,296, Cl. 260-5.000.
Ogawa, Rokutaro: *See*—
Ohno, Kenichi; Hosomizu, Tohru; Ogawa, Rokutaro; and Shimizu, Mitsuhisa, 4,255,672, Cl. 307-455.000.
Ogawa, Toshio; Ebara, Katsuya; and Takahashi, Sankichi, to Hitachi, Ltd.; and Hitachi Plant Engineering and Construction Co., Ltd. Tubular membrane separation process and apparatus therefor. 4,255,255, Cl. 210-652.000.
Ogawa, Toshio, to Murata Manufacturing Co., Ltd. Method for producing piezoelectric ceramics. 4,255,272, Cl. 252-62.900.
Ohara, Katsunobu; Tanaka, Keiji; Ando, Yujiro; and Moriyama, Inao, to Canon Kabushiki Kaisha. Electrophotographic screen process. 4,255,507, Cl. 430-53.000.
Ohashi, Masabumi: *See*—
Arakawa, Hideo; Kuniya, Keiichi; and Ohashi, Masabumi, 4,254,548, Cl. 29-879.000.
Ohishi, Tetsu: *See*—
Sugi, Nagatosh; and Ohishi, Tetsu, 4,255,567, Cl. 526-225.000.
Ohkura Electric Co., Ltd.: *See*—
Miyazaki, Seiichi, 4,255,813, Cl. 375-34.000.
Ohloff, Gunther: *See*—
Giersch, Wolfgang; and Ohloff, Gunther, 4,255,292, Cl. 252-522.00R.
Ohmori, Shoji; Matsuzaki, Atsushi; and Tominaga, Kiyonori, to Sony Corporation. Color television receiver AFPC circuit. 4,255,759, Cl. 358-19.000.
Ohno, Kenichi; Hosomizu, Tohru; Ogawa, Rokutaro; and Shimizu, Mitsuhisa, to Fujitsu Limited. Large scale semiconductor integrated circuit device. 4,255,672, Cl. 307-455.000.
Ohshima, Noboru: *See*—
Makino, Kenya; Miyabayashi, Toshio; Ohshima, Noboru; and Takeuchi, Yasumasa, 4,255,543, Cl. 526-92.000.
Ohta, Yutaka: *See*—
Kaide, Tamotsu; Gozen, Toshikazu; Taniguchi, Jinichi; and Ohta, Yutaka, 4,255,318, Cl. 260-42.180.
Ohtake, Kunihiko, to Ohtake Noodle Machine Mfg. Co., Ltd. Apparatus for frying instant noodles. 4,254,696, Cl. 99-349.000.
Ohtake Noodle Machine Mfg. Co., Ltd.: *See*—
Ohtake, Kunihiko, 4,254,696, Cl. 99-349.000.
Ohyama, Hiroshi; Takada, Sanae; Watanabe, Yoshihisa; Tamura, Jyotaroh; and Taketomi, Iwao, to Hokko Chemical Industry Co., Ltd. Substituted phenyl urea and herbicides for use in paddy field. 4,255,183, Cl. 71-120.000.
Oinoue, Kenichi: *See*—
Suzuki, Takeomi; Oinoue, Kenichi; Aoki, Masahiro; Kenjyo, Hideyuki; and Ida, Masatoshi, 4,255,654, Cl. 250-204.000.
Oishi, Kunizo: *See*—
Yamaguchi, Denjirou; Mogi, Noboru; Seta, Toshio; Oishi, Kunizo; Fuzimori, Yoshihisa; and Suzuki, Atsushi, 4,255,157, Cl. 44-3.00C.

Oka, Hidehiko; Terahara, Akira; and Endo, Akira, to Sankyo Company Limited. 4-Hydroxy-2-pyrone derivatives having antihyperlipaemic activity. 4,255,444, Cl. 424-279.000.

Okamoto, Koji: *See*—
Kidani, Yoshinori; Okamoto, Koji; and Saito, Reiko, 4,255,347, Cl. 260-429.00R.

Okamoto, Shiro: *See*—
Kidowaki, Yoshimasa; and Okamoto, Shiro, 4,254,817, Cl. 164-252.000.

Okamura, Kazuo: *See*—
Daimon, Shigeo; and Okamura, Kazuo, 4,255,299, Cl. 260-17.00R.

Okamura, Masatoshi; and Shiba, Haruo, to TDK Electronics Company Limited. Reel for tape cassette. 4,254,917, Cl. 242-68.500.

Okamura, Masayuki: *See*—
Takada, Shigetaka; Okamura, Masayuki; Naruse, Kazumichi; and Watanabe, Yukihiro, 4,254,754, Cl. 123-437.000.

Okano, Hirochika: *See*—
Ishikawa, Masami; Okano, Hirochika; Katagiri, Shigenobu; Asano, Mitsugu; and Fujieda, Toshiaki, 4,254,705, Cl. 101-93.290.

Oki Electric Industry Co., Ltd.: *See*—
Fukasawa, Atsushi; Ashiwa, Jun; and Sato, Takuro, 4,255,729, Cl. 333-202.000.

Oklejas, Eli: *See*—
Oklejas, Robert A.; and Oklejas, Eli, 4,255,081, Cl. 415-90.000.

Oklejas, Robert A.; and Oklejas, Eli. Centrifugal pump. 4,255,081, Cl. 415-90.000.

Okui, Yasuyuki. Boot tree. 4,254,524, Cl. 12-114.600.

Okuma Machinery Works Ltd.: *See*—
Toida, Ryuji; Sakai, Yuji; and Ikegami, Mitsuru, 4,255,682, Cl. 310-168.000.

Okuyama, Yasushi; and Suzuki, Tsuyoshi, to Nippon Electric Co., Ltd. Method for manufacturing a read-only memory device. 4,255,210, Cl. 148-187.000.

Olabisi, Olagoke, to Union Carbide Corporation. Structural foam molding process. 4,255,368, Cl. 264-45.500.

Olin, Arthur D., to Toms River Chemical Corporation. Synthesis of phenoxyanthraquinones. 4,255,342, Cl. 260-383.000.

Olschewski, Armin; Walter, Lothar; Brandenstein, Manfred; Kunkel, Heinrich; and Norlander, Gosta, to Sandvik AB; and Aktiebolaget SKF. Rotary drill bit. 4,255,000, Cl. 308-8.200.

Olson, Beverly J. E., to H. B. Fuller Company. Method of marking paved surfaces and curable two-part epoxy systems therefor. 4,255,468, Cl. 427-137.000.

Olszewski, Walter J., to Union Carbide Corporation. Cryogenic system for producing low-purity oxygen. 4,254,629, Cl. 62-13.000.

Oltra, Claude H.: *See*—
Bubley, Henry J.; Krutsch, John R.; and Oltra, Claude H., 4,254,708, Cl. 101-123.000.

O'Neil, Gerald D., to AMSTED Industries Incorporated. Railway truck side frame wear plate mounting. 4,254,712, Cl. 105-197.0DB.

Ono, Junichi: *See*—
Imamura, Naoki; Fukui, Isao; and Ono, Junichi, 4,255,051, Cl. 356-306.000.

Ono, Sekijyuro: *See*—
Kuroda, Masao; Ono, Sekijyuro; Katakura, Kageyoshi; and Kondo, Toshio, 4,254,662, Cl. 73-626.000.

Ono, Shigetoshi; Harada, Tooru; Fujita, Shinsaku; and Yoshida, Yoshinobu, to Fuji Photo Film Co., Ltd. Photographic light-sensitive sheet for the color diffusion transfer process. 4,255,509, Cl. 430-216.000.

Onoda, Makoto; and Nakajima, Kazuyoshi, to NTN Toyo Bearing Company, Limited. Method of controlling infeed in the compound grinding. 4,254,588, Cl. 51-291.000.

Onooka, Yasushi, to Mitsubishi Denki Kabushiki Kaisha. Dustproof type magnetic disc apparatus. 4,255,770, Cl. 360-69.000.

Oouchi, Yoozoo: *See*—
Takeyasu, Kiyoo; Kato, Kanji; Goto, Tatsuo; Oouchi, Yoozoo; Yoshida, Kazuhiro; Ito, Yoshitoshi; and Takami, Katsumi, 4,255,762, Cl. 358-100.000.

Opgenorth, Hans-Joachim; Scheuermann, Horst; Laas, Harald; and Nissen, Axel, to BASF Aktiengesellschaft. Preparation of indolenines. 4,255,333, Cl. 260-319.100.

Opitz, Norbert: *See*—
Lubbers, Dietrich W.; and Opitz, Norbert, 4,255,053, Cl. 356-318.000.

Oppenlaender, Knut; Strickler, Rainer; Geelhaar, Hans J.; Lamprecht, Josef; Penzel, Erich; and Ley, Gregor, to BASF Aktiengesellschaft. Aqueous paints which contain polyglycidylamines as additives. 4,255,310, Cl. 260-29.60T.

Orosa, Jose S. Knockdown rattan chair. 4,254,992, Cl. 297-440.000.

Orozco, Hector M. Free-wheeling mechanism. 4,254,852, Cl. 192-46.000.

Orozco Rodriguez, Leoncio R.; Urrutia Herrera, Jose A.; and Suarez, Eduardo R. Process for inhbiting the deterioration of cane sugar. 4,255,204, Cl. 127-46.00R.

Osa, Tetsuo; and Fujihira, Masamichi, to Tohoku University, President of. Internally reflective, dye sensitized, wet-type photocell. 4,255,501, Cl. 429-111.000.

Osawa Precision Industries, Ltd.: *See*—
Yukio, Katahira, 4,255,020, Cl. 350-430.000.

Osborn, James L., to Motorola, Inc. Simulcast transmission system. 4,255,814, Cl. 455-51.000.

Osborn, Merlin L.: *See*—
Reen, Orville W.; and Osborn, Merlin L., 4,255,494, Cl. 428-551.000.

Ostermeyer, Peter; and Hultsch, Gunther, to Krauss-Maffei Aktiengesellschaft. Pocket-type sieve centrifuge. 4,254,904, Cl. 233-2.000.

Otaki, Toshihiro: *See*—
Katoh, Kazunobu; Fujita, Saburo; Otaki, Toshihiro; and Nakashima, Shozi, 4,255,516, Cl. 430-533.000.

Otouma, Hiroshi: *See*—
Oda, Yoshio; Otouma, Hiroshi; and Endoh, Eiji, 4,255,247, Cl. 204-293.000.

Otsuka, Isao, to Japan Styrene Paper Corporation. Apparatus for producing corrugated foamed plastic sheet. 4,255,110, Cl. 425-381.000.

Ott, Helmut, to Herion-Werke Kg. Directional control valve. 4,254,798, Cl. 137-625.660.

Ottmann, Rudolf: *See*—
Emmerich, Hermann; and Ottmann, Rudolf, 4,255,109, Cl. 425-227.000.

Overton, Arthur W.: *See*—
Campbell, Dudley H.; Daggerhart, James A.; and Overton, Arthur W., 4,255,635, Cl. 200-159.00A.

Owen, Donald W. Transformer with tapped subwindings. 4,255,734, Cl. 336-147.000.

Owens-Corning Fiberglas Corporation: *See*—
Coakley, Thomas A.; Rubadue, John E.; Forman, Carl E.; and Schweizer, Robert A., 4,255,317, Cl. 260-37.00N.
Pierce, Richard H.; and Eisenberg, Arnold J., 4,254,610, Cl. 57-22.000.
Yau, Ben J., 4,255,485, Cl. 428-288.000.

Owens-Illinois, Inc.: *See*—
Heier, Robert J., 4,254,869, Cl. 206-497.000.

Oxy Metal Industries Corporation: *See*—
Howell, John K., Jr., 4,255,305, Cl. 260-29.300.

Oy W. Rosenlaw Ab: *See*—
Puurunen, Juhani E., 4,255,407, Cl. 423-390.000.

Oya, Masayuki: *See*—
Iwao, Jun-ichi; Oya, Masayuki; and Chiba, Takehisa, 4,255,446, Cl. 424-301.000.

Ozawa, Kiyomi; Ishii, Shigeru; Hayashi, Mamoru; Hirose, Masayoshi; and Hirata, Kiminori, to Nissan Chemical Industries Limited. Acaricidal compounds of cyclopropane carboxylic acid derivatives. 4,255,447, Cl. 424-304.000.

Pacey, Grant K.; Hughes, Ronald F.; Trumble, William P.; and Lukas, Helmut H., to Northern Telecom Limited. Protective package for an optical fiber splice. 4,254,865, Cl. 206-316.000.

Padco, Inc.: *See*—
Cooke, Donald R., 4,254,529, Cl. 15-230.110.

Palm, Peter: *See*—
Engelbach, Heinz; Hoffmann, Harry; Palm, Peter; Sommer, Karl; and Sprague, Michael J., 4,255,285, Cl. 252-443.000.

Paoletti, Ugo; and Volterra, Alessandro, to SNIA Viscosa Societa' Nazionale Industria Applicazioni Viscosa S.p.A. Device for the continuous spinning of viscose rayon. 4,255,101, Cl. 425-68.000.

Pape, Jurgen: *See*—
Eisele, Dieter; Pape, Jurgen; and Hochhut, Armin, 4,254,590, Cl. 51-324.000.

Papmahl, Fritz, to LGA Gas and Marine Consult GmbH. Anchored marine fluid transfer buoy. 4,254,521, Cl. 9-8.00P.

Pappas, Peter G.; and Abdul-Malek, Adel B., to Standard Oil Company (Indiana). Flow improver for heavy petroleum products comprising alkenyl succinate diester. 4,255,160, Cl. 44-70.000.

Papsdorf, Kurt R., to Deams (Proprietary) Limited. Combustion unit. 4,254,617, Cl. 60-39.46G.

Parent, Richard G.; and Elyanow, Irving D., to Ionics, Incorporated. Corrosion resistant electrode connector assembly. 4,255,012, Cl. 339-242.000.

Parker-Hannifin Corporation: *See*—
Jelinek, Jerry G., 4,254,960, Cl. 277-12.000.

Parker, John J.: *See*—
Fouss, James L.; Parker, John J.; and Lytle, Donald A., 4,254,885, Cl. 220-72.000.

Patinet, Jean-Francois, to Compagnie Generale pour les Developpements Operationnels des Richesses Sous-Marines "C.G. Doris". Device for mooring and connecting a submarine conduit, and method employing the said device. 4,254,728, Cl. 114-230.000.

Patterson, Franklin G., deceased, to General Electric Company. Method and apparatus for locating underwater objects. 4,255,800, Cl. 367-99.000.

Patton, Franklin D.; and McFarlane, James D., to Westbay Instruments Ltd. Sampler and measurement apparatus. 4,254,832, Cl. 166-332.000.

Pauk, Henry T.: *See*—
Cormier, Raymond G.; Davis, Austin; Guiguizian, Jacques; Lutz, Leo O.; and Pauk, Henry T., 4,255,044, Cl. 355-15.000.

Paul, Kalidas; and Kyker, Glendon D., to Velsicol Chemical Corporation. Process for preparing hexachlorocyclopentadiene. 4,255,597, Cl. 570-220.000.

Paul, Volker: *See*—
Knops, Hans-Joachim; Brandes, Wilhelm; and Paul, Volker, 4,255,437, Cl. 424-270.000.

Paulfeuerborn, Clemens. Shot or sand blasting machine. 4,254,593, Cl. 51-425.000.

Pauling, Horst: *See*—
Wilke, Gunther; Bogdanovic, Borislav; and Pauling, Horst, 4,255,595, Cl. 568-821.000.

Paulson, Leland E.; and Smith, Peter J. Fixture for hanging large panels. 4,254,945, Cl. 269-102.000.

Peavey Company: *See*—
Arendt, Phillip S., 4,255,456, Cl. 426-64.000.

Pedersen, Ernst L.; and Balslev, Erik, to A/S Orthana Kemisk Fabrik. Method and an apparatus for making basic material for the production of a biologically active preparation. 4,254,535, Cl. 17-45.000.

Pedrick, William H.: *See—*
Boba, Joseph; Conger, Robert P.; and Pedrick, William H., 4,255,231, Cl. 156-645.000.

Peevers, Eileen S.: *See—*
Crofts, Michael E.; Peevers, Michael S.; and Peevers, Eileen S., 4,255,226, Cl. 156-541.000.

Peevers, Michael S.: *See—*
Crofts, Michael E.; Peevers, Michael S.; and Peevers, Eileen S., 4,255,226, Cl. 156-541.000.

Pehl, Wolfgang: *See—*
Roker, Klaus-Dieter; Pehl, Wolfgang; and Reichenbach, Diethelm, 4,254,812, Cl. 152-211.000.

Peleschka, Gerhart; and Sallmann, Dieter, to WIBAU Industrie und Verwaltung GmbH. Apparatus for preparing bituminous mixtures, especially road construction mixtures. 4,255,058, Cl. 366-25.000.

Penco Division of Hudson Engineering Company: *See—*
Piegza, Tad, 4,255,079, Cl. 415-11.000.

Penird, Carl W.: *See—*
Fischman, Martin; Hallett, Joseph L.; and Penird, Carl W., 4,255,689, Cl. 315-3.000.

Pennwalt Corporation: *See—*
Burns, Charles F., 4,255,192, Cl. 75-169.000.
Gardner, David A.; and Clark, Roger T., 4,255,357, Cl. 564-480.000.

Penzel, Erich: *See—*
Oppenlaender, Knut; Strickler, Rainer; Geelhaar, Hans J.; Lamprecht, Josef; Penzel, Erich; and Ley, Gregor, 4,255,310, Cl. 260-29.60T.

Pepin, Richard L.: *See—*
Altherr, Eric; Hafer, Ronald L.; and Pepin, Richard L., 4,255,153, Cl. 8-582.000.

Peralta, Antonio L.; and Eslava, Luis M. C. Process for obtaining refractory materials with controlled characteristics of porosity and density. 4,255,197, Cl. 106-41.000.

Percival, Wiliam S.: *See—*
Clow, Hugh; Walters, Peter E.; and Percival, Wiliam S., 4,254,778, Cl. 128-653.000.

Pere, Gerard: *See—*
Maire, Jacques; and Pere, Gerard, 4,255,245, Cl. 204-257.000.

Perez, Henry S.; and Schwarz, Theodore A., to International Business Machines Corporation. Read/write magnetic head assembly with magnetoresistive sensor. 4,255,772, Cl. 360-113.000.

Perfiliev, Vladimir V.: *See—*
Zatsepin, Nikolai N.; Siljuk, Viktor F.; Malko, Ivan I.; Kaloshin, Valentin A.; Aniskovich, Valery M.; Naumenko, Nikolai N.; and Perfiliev, Vladimir V., 4,255,709, Cl. 324-229.000.

Perkin-Elmer Corporation, The: *See—*
Williams, Charles J., 4,255,057, Cl. 356-435.000.

Perry, George. Portable fire extinguisher with liquid and pressure gas tanks. 4,254,833, Cl. 169-76.000.

Peter, Kurt; and Muck, Gerhard. Cartridge load for a revolver. 4,254,571, Cl. 42-89.000.

Peters, Edward N., to Union Carbide Corporation. Polymeric compositions containing elemental red phosphorus, aldehydes or ketones or mixtures thereof. 4,255,319, Cl. 260-45.70P.

Peters, Thomas E.: *See—*
Bleymaier, Joseph S.; Farnworth, Wilfred; and Peters, Thomas E., 4,255,108, Cl. 425-174.80E.

Peterson, Anders A., to Hardinge Brothers, Inc. Pre-setter for positioning tooling on turrets. 4,255,056, Cl. 356-401.000.

Peterson, Bruce E., to Double E Company, Inc. Air shaft. 4,254,920, Cl. 242-72.100.

Peterson, Erik R. Communication module. 4,255,741, Cl. 340-147.00R.

Petrick, Ernest N., to United States of America, Army. Vehicle suspension using pressurized Bourdon tubes. 4,254,970, Cl. 280-705.000.

Petrie, Adelore F. Digital waveform conditioning circuit. 4,255,712, Cl. 328-162.000.

Petrocarbon Developments Limited: *See—*
Isalski, Wieslaw H.; and Tomlinson, Terence R., 4,255,406, Cl. 423-359.000.

Pfaff Industriemaschinen GmbH: *See—*
Hager, Walter; and Walther, Karl-Heinz, 4,254,725, Cl. 112-292.000.

Pfeifer, Josef, to Ciba-Geigy Corporation. Transparent copolyamide from 1,10-disubstituted-1,10 diamine. 4,255,559, Cl. 528-338.000.

Pfeifer, Peter H. Window cleaning implement. 4,254,527, Cl. 15-121.000.

Pfizer Inc.: *See—*
Kraska, Allen R., 4,255,426, Cl. 424-250.000.

Philipp Holzmann AG: *See—*
Zerna, Wolfgang; Krabbe, Wilfried; and Schafer, Hans, 4,255,366, Cl. 264-35.000.

Philips Petroleum Company: *See—*
Sanford, Richard A.; and Dennis, William H., 4,254,656, Cl. 73-61.10C.

Phillips Petroleum Company: *See—*
Dixon, Rolland E., 4,255,605, Cl. 585-332.000.

Phillips, Christopher A. P., to De La Rue Systems Limited. Sheet counting method and apparatus. 4,255,651, Cl. 235-92.0SB.

Phillips Petroleum Company: *See—*
Bertus, Brent J.; and McKay, Dwight L., 4,255,287, Cl. 252-455.00Z.
Drake, Charles A.; and Marwil, Stanley J., 4,255,352, Cl. 260-465.80R.
Sitton, Donald M.; and Sarrett, Homer J., Jr., 4,255,270, Cl. 252-8.55D.
Solomon, Paul W., 4,255,341, Cl. 260-348.340.
Udipi, Kishore, 4,255,536, Cl. 525-314.000.

Phillips, William R., Jr.; and Tate, Ronald D., to Dravo Corporation. Method of controlling series fans driving a variable load. 4,255,089, Cl. 417-2.000.

Picker Corporation: *See—*
Rutt, Brian K.; and Fenster, Aaron, 4,255,664, Cl. 250-445.00T.

Piegza, Tad, to Penco Division of Hudson Engineering Company. Self-priming system for pumps. 4,255,079, Cl. 415-11.000.

Pierce, Richard H.; and Eisenberg, Arnold J., to Owens-Corning Fiberglas Corporation. Strand splicing apparatus. 4,254,610, Cl. 57-22.000.

Pincetich, Vincent J. Handheld support for camera and photographic lamp. 4,255,036, Cl. 354-293.000.

Pine, Danny R. Portable traction track for vehicle driving wheel. 4,254,907, Cl. 238-14.000.

Pine, Lloyd A.: *See—*
Balinsky, George J.; Pine, Lloyd A.; and Mertzweiller, Joseph K., 4,255,289, Cl. 252-466.00B.

Pingaud, Bernard J.: *See—*
Audran, Roger G. L.; and Pingaud, Bernard J., 4,255,492, Cl. 428-694.000.

Pistun, Philip J.: *See—*
Fulton, Edward W.; and Pistun, Philip J., 4,254,703, Cl. 100-2.000.

Piteau, Marc D.: *See—*
Coqueugniot, Annick G.; Bruggeman, Robert J.; and Piteau, Marc D., 4,255,243, Cl. 204-159.150.

Pitney Bowes Deutschland GmbH: *See—*
Schottle, Helmut A. M., 4,255,073, Cl. 414-32.000.

Piziali, Raymond A.: *See—*
Taylor, Douglas P.; and Piziali, Raymond A., 4,254,988, Cl. 296-190.000.

Plath, Peter; Rohr, Wolfgang; and Goetz, Norbert, to BASF Aktiengesellschaft. N-Substituted 2,6-dialkylanilines and process for their preparation. 4,255,587, Cl. 560-43.000.

Playter, George H., Jr. Pitching practice device. 4,254,952, Cl. 273-26.00A.

Plemmons, Jerry R.; and Blake, Walter R., to General Electric Company. Luminaire latch device. 4,255,781, Cl. 362-374.000.

Plessey Handel und Investments AG: *See—*
Hudson, John A.; James, Nicholas A.; and Morley, Edward G., 4,255,092, Cl. 417-222.000.

Plibrico Company: *See—*
Skifano, Anthony J.; and Bouts, Melvin L., 4,255,127, Cl. 432-3.000.

Pluchino, Luciano: *See—*
Galimi, Giuseppe; Montalto, Mario; and Pluchino, Luciano, 4,255,263, Cl. 210-321.100.

Plunkett, Allan B.; and Turnbull, Fred G., to General Electric Company. Method and apparatus for control of inverter synchronous machine drive system. 4,255,695, Cl. 318-723.000.

Pohl, Gerhard: *See—*
Knorre, Helmut; Langer, Manfred; and Pohl, Gerhard, 4,255,252, Cl. 208-182.000.

Pohlenz, Hans, to Stabilus GmbH. Damping arrangement. 4,254,849, Cl. 188-275.000.

Polaroid Corporation: *See—*
Cincotta, Louis; and Foley, James W., 4,255,578, Cl. 546-96.000.
Johnson, Bruce K.; and Whiteside, George D., 4,255,030, Cl. 354-27.000.
Johnson, Bruce K.; Whiteside, George D.; and LaRocque, Arthur G., 4,255,031, Cl. 354-53.000.
Moodie, Donald E., 4,254,919, Cl. 242-71.800.
Moodie, Donald E., 4,255,025, Cl. 352-130.000.
Nawn, George H.; and Rickter, Donald O., 4,255,512, Cl. 430-219.000.

Polysius AG: *See—*
Schulte, Hans-Gerd; and Merz, Heinz-Emil, 4,255,185, Cl. 75-36.000.

Pompes Guinard: *See—*
Goulvestre, Loic R. Y.; and Lepert, Claude M. M., 4,255,095, Cl. 417-406.000.

Ponsford, Roger J.; Baxter, Andrew J. G.; and Southgate, Robert, to Beecham Group Limited. β-Lactam antibiotics, a process for their prepaeration and their use in pharmaceutical compositions. 4,255,441, Cl. 424-274.000.

Poore, Albert C. G., to Sterling Drug Inc. Packaging element. 4,254,871, Cl. 206-534.000.

Popov, Alexandr D.; Solomin, Vladimir A.; and Trofimov, Vladimir A. Linear induction motor. 4,255,680, Cl. 310-13.000.

Popper, Robert H., Jr. Apparatus for enabling movement of a binder. 4,254,929, Cl. 248-447.000.

Postupack, Dennis S.; Allerton, David A.; and Emmert, Richard L., to PPG Industries, Inc. Apparatus for forming graded shade band on substrate. 4,254,734, Cl. 118-624.000.

Postupack, Dennis S.; and Allerton, David A., to PPG Industries, Inc. Apparatus for supporting flexible sheet while applying graded shade band thereon. 4,254,735, Cl. 118-700.000.

Powell, Justin C., to Texaco Inc. Method for preparing an alkenyl-substituted dicarboxylic acid anhydride. 4,255,340, Cl. 260-346.740.

Powell, Thomas E.; Donaldson, Edward; and McNeil, Ronald F., to White Motor Corporation of Canada Limited. Apparatus for discharging threshed materials directly from the rotor of an axial flow combine. 4,254,780, Cl. 130-27.00T.

Pozzolanic Limited: *See—*
Savarese, Joseph, 4,254,698, Cl. 99-460.000.
PPG Industries, Inc.: *See—*
Postupack, Dennis S.; Allerton, David A.; and Emmert, Richard L., 4,254,734, Cl. 118-624.000.
Postupack, Dennis S.; and Allerton, David A., 4,254,735, Cl. 118-700.000.
Pracht, Gunther: *See—*
Megna, Salvatori G.; and Pracht, Gunther, 4,254,551, Cl. 30-341.000.
Prager, Edward N.; and Burnett, Louis E., to Keebler Company. Packaging machine having a slitter for forming slits in ends of packages. 4,254,601, Cl. 53-133.000.
Pratt, Anthony M. J. Manufacture of powered air compressors. 4,255,090, Cl. 417-53.000.
Pratt Burnerd International Limited: *See—*
Wilson, Bernard, 4,254,676, Cl. 82-34.00R.
Pratt & Whitney Aircraft of Canada Limited: *See—*
Roberts, Ivor J., 4,255,086, Cl. 416-218.000.
Prause, Reinhard, to Krautkramer-Branson, Inc. Ultrasonic test method and apparatus with coupling liquid temperature compensation. 4,254,660, Cl. 73-597.000.
Premier Forging Press Automation, Inc.: *See—*
Babbitt, Albert B., 4,255,075, Cl. 414-222.000.
Pretorius, Peter S.: *See—*
Katcs, Michael W.; De Luca, Peter J.; and Pretorius, Peter S., 4,254,863, Cl. 206-216.000.
Preziosi, Anthony F.: *See—*
Baughman, Ray H.; Turi, Edith A.; Preziosi, Anthony F.; and Yee, Kwok-Chun, 4,255,535, Cl. 525-129.000.
Price, Barry J.; Clitherow, John W.; and Bradshaw, John, to Allen & Hanburys Limited. Furan derivatives having selective action on histamine receptors. 4,255,440, Cl. 424-274.000.
Price, Edward H.: *See—*
Molnar, Charles J.; Price, Edward H.; and Resnick, Paul R., 4,255,240, Cl. 204-98.000.
Price-Falcon, Juan F.: *See—*
Flores-Verdugo, Marco A.; Chapa-Martinez, Leobardo; and Price-Falcon, Juan F., 4,254,876, Cl. 209-577.000.
Price, Jerry L.: *See—*
Makin, Earle C.; Price, Jerry L.; and Wei, Yu W., 4,255,591, Cl. 562-517.000.
Prichard, William W., to Du Pont de Nemours, E. I., and Company. Process for the preparation of 2,5-dihydrofuran. 4,255,338, Cl. 260-346.110.
Prince Castle, Inc.: *See—*
Steiner, Robert A.; and Novy, Robert A., 4,254,678, Cl. 83-425.300.
Prochem Establishment: *See—*
MacDonald, Peter, 4,255,331, Cl. 260-239.55R.
Procter & Gamble Company, The: *See—*
Sakkab, Nabil Y., 4,255,273, Cl. 252-102.000.
Proctor, Harry P., to National Can Corporation. Ironing die for ironing press. 4,254,652, Cl. 72-467.000.
Propst, Robert L.; and Wodka, Michael A., to Herman Miller, Inc. Energy distribution system for enclosed areas. 4,255,611, Cl. 174-48.000.
Prosen, Emil M., to Neoloy Products, Inc. Essentially non-precious stainless dental alloy. 4,255,190, Cl. 75-134.00C.
Prvni brnenska strojirna, narodni podnik: *See—*
Cervenka, Juraj; Psenica, Jan; Horak, Miroslav; and Horak, Jiri, 4,254,649, Cl. 72-128.000.
Pryde, Alexander W. H.: *See—*
Jones, Ronald H.; and Pryde, Alexander W. H., 4,255,358, Cl. 568-931.000.
Psenica, Jan: *See—*
Cervenka, Juraj; Psenica, Jan; Horak, Miroslav; and Horak, Jiri, 4,254,649, Cl. 72-128.000.
Purinton, Robert J., Jr., to Dow Chemical Company, The. Method for drying pipelines. 4,254,559, Cl. 34-9.000.
Puthon, Joseph: *See—*
Joly, Jean; and Puthon, Joseph, 4,255,476, Cl. 428-82.000.
Puurunen, Juhani E., to Oy W. Rosenlaw Ab. Method for the regeneration of pickling acids. 4,255,407, Cl. 423-390.000.
PVI Industries Inc.: *See—*
Adams, Charles L., 4,254,826, Cl. 165-143.000.
Quaker Oats Company, The: *See—*
Wuskell, Joseph P., 4,255,554, Cl. 528-129.000.
Quanta-Ray, Inc.: *See—*
Herbst, Richard L., 4,255,718, Cl. 331-94.50L.
Quantor Corporation: *See—*
Meadows, John W.; and Ritter, Robert J., 4,255,037, Cl. 354-299.000.
Quinto, Dennis T.: *See—*
Bhattacharya, Debanshu; Quinto, Dennis T.; and Holowaty, Michael O., 4,255,187, Cl. 75-123.0AA.
R. W. Hartnett Company: *See—*
Ackley, Charles E., Sr.; and Ackley, Charles E., Jr., 4,254,704, Cl. 101-37.000.
Raasch, Marie-Luise: *See—*
Bergfeld, Jost; Raasch, Marie-Luise; Konig, Ingo; and Brussow, Klaus-Peter, 4,255,420, Cl. 424-177.000.
Raddi, William J.: *See—*
Johnson, Robert W.; and Raddi, William J., 4,255,746, Cl. 340-577.000.
Raden, Daniel S.; Maripuri, Chala V.; and Becker, Frank C., to Abbott Laboratories. Polyurethane process. 4,255,528, Cl. 521-129.000.
Ramot University Authority for Applied Research and Industrial Development Ltd.: *See—*
Deutscher, Siegfried G.; and Grunbaum, Enrique, 4,255,208, Cl. 148-175.000.
Ranalli, Alfonso. Aerial navigation instruments. 4,254,568, Cl. 40-518.000.
Rashleigh, Scott C.: *See—*
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Ratcliff Tail Lifts Limited: *See—*
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Rath, Albert, to C.E.P. Industries Limited. Reversible snowplow attachment. 4,254,564, Cl. 37-42.0VL.
Rattie, Elisabeth S.; and Ravin, Louis J., to SmithKline Corporation. Gelatin capsule dosage unit containing triamterene. 4,255,413, Cl. 424-37.000.
Rauch, Gary C.; Thornburg, Donald R.; and Foster, Karl, to Westinghouse Electric Corp. Oriented low-alloy iron containing critical amounts of silicon and chromium. 4,255,215, Cl. 148-31.550.
Ravin, Louis J.: *See—*
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Raytheon Company: *See—*
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RCA Corporation: *See—*
Aschwanden, Felix, 4,255,758, Cl. 358-14.000.
Ferrie, Ronald G., 4,255,740, Cl. 340-146.200.
Hakala, David F., 4,255,504, Cl. 430-28.000.
Kane, James, 4,255,514, Cl. 430-320.000.
Knop, Karl H., 4,255,019, Cl. 350-162.0SF.
Rosen, Arye, 4,255,714, Cl. 329-103.000.
Reade, Richard F., to Corning Glass Works. Stable, chemically-strengthenable lithium aluminosilicate glasses. 4,255,199, Cl. 106-53.000.
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Redmond, James D., to Amax Inc. Method for producing solar collector plates. 4,255,213, Cl. 148-6.110.
Redmond, James D.: *See—*
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Reeberg, Christiaan C. L. Grease gun stand. 4,254,926, Cl. 248-152.000.
Reed, Elmer E.: *See—*
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Reed, Robert E. Emergency dialing aid and marking assembly. 4,255,622, Cl. 179-90.00A.
Reed, Roger D.; and Reed, Elmer E., to DePew, Thomas N., a part interest. Apparatus and method for processing organic materials into more useful states. 4,255,129, Cl. 432-13.000.
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Reeder, Harold E., to Load Safe Systems, Inc. Closed chemical mixing system. 4,254,805, Cl. 141-59.000.
Reen, Orville W.; and Osborn, Merlin L., to Allegheny Ludlum Steel Corporation. Sintered ferromagnetic powder metal parts for alternating current applications. 4,255,494, Cl. 428-551.000.
Reese, Dwayne E.: *See—*
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Regan, Michael T.: *See—*
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Regnault, Bernard; and Revol, Pierre, to Rhone-Poulenc-Textile. Process for the regeneration of polymer from waste. 4,255,295, Cl. 260-2.300.
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Reinwald, Elmar; Schwuger, Milan J.; Smolka, Heinz; and Krings, Peter, to Henkel Kommanditgesellschaft auf Aktien (Henkel KGaA). Process and apparatus for machine washing and cleaning with low-phosphate or phosphate-free washing solutions. 4,255,148, Cl. 8-137.000.
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Rende, Dominic S.; and Cosper, David R., to Nalco Chemical Company. Use of polyacrylic acid in pulp bleaching processes to preserve pulp strength and aid in brightness. 4,255,233, Cl. 162-73.000.
Rennolds, Philip J., to Du Pont de Nemours, E. I., and Company. Corrugated interface zone refiner. 4,255,390, Cl. 422-250.000.

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Rex, Albert E. Rail cleat. 4,254,909, Cl. 238-340.000.
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Rhodes, Richard P.: *See*—
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Brunelle, Jean-Pierre, 4,255,359, Cl. 570-243.000.
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Rickert, Hans; and Holzapfel, Gunter, to Vereinigte Elektrizitatswerke Westfalen AG. Water tank having electric heating element and cathodic corrosion protection. 4,255,647, Cl. 219-322.000.
Rickrode, Jack A.; and Frame, Charles W., to Chambersburg Engineering Company. Method and apparatus for pressing wheels and other members onto and off of an axle. 4,254,663, Cl. 73-714.000.
Rickter, Donald O.: *See*—
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Riekels, Lynda M., to Inland Steel Company. Free machining steel with bismuth and manganese sulfide. 4,255,188, Cl. 75-123.0AA.
Ries, Walter, to Braunschweigische Maschinenbauanstalt. Method for drying sludge. 4,255,232, Cl. 159-47.00R.
Rigler, Josef K.; Schafer, Wolfgang; Leithauser, Horst; Trukenbrod, Karl; and Bollmann, Werner, to Chemische Werhe Huls AG. Small particulate expandable styrene polymer molding compositions. 4,255,525, Cl. 521-57.000.
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Riley, Leon H. Multiple cell electromagnetic radiation test system. 4,255,750, Cl. 343-703.000.
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Ritter, Ernst; and Schwartz, Reinhard, to Robert Bosch GmbH. Speed governor for fuel injected internal combustion engines. 4,254,753, Cl. 123-366.000.
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Robbins, Thomas R. Reactor and fuel assembly design for improved fuel utilization in liquid moderated thermal reactors. 4,255,236, Cl. 176-20.0SS.
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Sauer, Joseph; Kadelbach, Volker; and Will, Gerhard, 4,254,671, Cl. 74-866.000.
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Wolf, Theo; Gause, Dieter; Schneider, Hans-D.; and Gunschmann, Peter, 4,254,922, Cl. 242-194.000.
Roberts, Ivor J., to Pratt & Whitney Aircraft of Canada Limited. Locking device for blade mounting. 4,255,086, Cl. 416-218.000.
Roberts, Roy D.; and Richter, George N., to Texaco Inc. Partial oxidation process with recovery of unconverted solid fuel from suspension in water. 4,255,278, Cl. 252-373.000.
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Katchka, Jay R., 4,255,118, Cl. 431-46.000.
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Marquis, Edgar E., 4,255,627, Cl. 200-38.00R.
Robertson, Michael D.: *See*—
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Rock, Erich; and Mages, Bernhard, to Julius Blum Gesellschaft m.b.H. Pull-out guide for drawers. 4,255,002, Cl. 312-348.000.
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Adams, Washington; and Miller, Kenneth J., 4,255,015, Cl. 350-96.200.
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Wong, Daniel T., 4,254,667, Cl. 74-526.000.
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Rodriquez, Rodolfo R.: *See*—
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Kroon, David H.; Bushman, James B.; and Rog, Joseph W., 4,255,241, Cl. 204-147.000.
Rogan, John B.; and Buehler, Charles K., to Standard Oil Company (Indiana). Alpha-olefin polymerization catalyst and process. 4,255,281, Cl. 252-429.00B.
Rohan, Joseph J.; and Kuehl, Gregory W. Apparatus for audible altering of enclosure opening. 4,255,745, Cl. 340-546.000.
Rohm and Haas Company: *See*—
Emmons, William D.; Sperry, Peter R.; and Kaplan, Fred A., 4,255,196, Cl. 106-29.000.
Hunt, Walter H., IV; and Craig, Lynn W., 4,254,589, Cl. 51-318.000.
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Roker, Klaus-Dieter; Pehl, Wolfgang; and Reichenbach, Diethelm, to Continental Gummi-Werke Aktiengesellschaft. Pneumatic vehicle tire. 4,254,812, Cl. 152-211.000.
Rolke, Rudi; and Tewes, Heinz. Bolting device, particularly for coke-oven doors. 4,254,974, Cl. 292-259.000.
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Simpson, Trevor W., 4,255,174, Cl. 55-347.000.
Romeo, Samuel T. Waste disposal system. 4,255,260, Cl. 210-121.000.
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Tricoles, Gus P.; and Rope, Eugene L., 4,255,702, Cl. 324-58.00B.
Rosa, John, to Westinghouse Electric Corp. Transformer-rectifier apparatus. 4,255,784, Cl. 363-129.000.
Rose, Boyd W., to FMC Corporation. Weight sizing apparatus. 4,254,877, Cl. 209-594.000.
Rose, Calvin D. Drum and drumhead structure. 4,254,685, Cl. 84-414.000.
Rose, Gordon M. Universal focus multiplanar camera. 4,255,033, Cl. 354-110.000.
Roselius, Ludwig; Kurzhals, Hans-Albert; and Hubert, Peter, to Hag Aktiengesellschaft. Method for the selective extraction of caffeine from vegetable materials. 4,255,458, Cl. 426-424.000.
Rosen, Arye, to RCA Corporation. GaAs Dual-gate FET frequency discriminator. 4,255,714, Cl. 329-103.000.
Rosen, Perry, to Hoffmann-La Roche Inc. Process for preparing 2,4-diamino-pyrimidines. 4,255,574, Cl. 544-323.000.
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Rosenthal, Joel W.; Dahlberg, Arthur J.; and Kuehler, Christopher W., to Chevron Research Company. Two-stage coal liquefaction process with process-derived solvent having a low heptane-insolubiles content. 4,255,248, Cl. 208-8.0LE.
Ross, Gray E. D., to Zenith Carburetter Company Limited, The. Accelerator pump control apparatus. 4,255,362, Cl. 261-34.00B.

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Rothstein, Sheldon. Decorative stitch formation. 4,254,723, Cl. 112-255.000.
Rouby, Michel; and Eymery, Jean-Paul, to Creusot-Loire. Iron-containing alloys resistant to seawater corrosion. 4,255,186, Cl. 75-122.000.
Rowland, Stanley P.; Blouin, Florine A.; and Shih, Frederick F., to United States of America, Agriculture. Abrasion resistance and strength of cotton-containing fabric made resilient with N-methylolacrylamide-type reagent. 4,255,149, Cl. 8-184.000.
Roy, Santanu, to Thagard, George F., Jr. Novel blowing agent for polymeric foam process. 4,255,527, Cl. 521-117.000.
Rozmus, Walter J., to Kelsey-Hayes Company. Hot consolidation of powder metal-floating shaping inserts. 4,255,103, Cl. 425-78.000.
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Rucha, Ulrich; and Dietze, Wolfgang, to Siemens Aktiengesellschaft. Method of deposition of silicon in fine crystalline form. 4,255,463, Cl. 427-51.000.
Rudolf Hell GmbH.: *See—*
Knop, Hans-Georg; and Hoffrichter, Ingo, 4,255,761, Cl. 358-80.000.
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Rudy, Jerome; Lazzara, Frederick; Cowles, Warren W.; and Cahn, Arno, to Lever Brothers. Fabric softening composition. 4,255,294, Cl. 252-524.000.
Rugroden, Roger R. Thermally isolated roof structure. 4,254,598, Cl. 52-199.000.
Rusnak, Thomas L. Golf swing training apparatus. 4,254,956, Cl. 273-186.00R.
Russell, Larry R. Methods and apparatus for controlling fluid flow. 4,254,836, Cl. 175-65.000.
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Sahm, Karl-Frieder; van Rensen, Enno; Rieger, Horst; and Jaeger, Franz, to Dornier System GmbH. Non-destructive testing of structural elements for fatigue by measurement of specular reflectance. 4,255,049, Cl. 356-32.000.
St. John, Richard C., to Aspro, Inc. Method of making clutch housing and pulley assembly. 4,254,541, Cl. 29-445.000.
St. John, Richard C., to Dyneer Corporation. Centrifugal clutch shoe mounting arrangement. 4,254,854, Cl. 192-105.0CD.
Saito, Hideo, to Keihin Electric Express Railway Co., Ltd.; and Tokyo Shibaura Denki Kabushiki Kaisha. Telephone reservation-processing system. 4,255,619, Cl. 179-2.00A.
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Sakamoto, Minoru. Attachable toilet bowl seat and footrest. 4,254,514, Cl. 4-234.000.
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Kugisawa, Toshio; and Sakashita, Noriji, 4,254,681, Cl. 84-1.010.
Sakellaris, Peter C. Illumination assembly for use with electrical terminal units. 4,255,780, Cl. 362-32.000.
Sakkab, Nabil Y., to Procter & Gamble Company, The. Fabric bleaching and stain removal compositions. 4,255,273, Cl. 252-102.000.
Sakurai, Hisaya; Morita, Hideo; Miya, Masayoshi; Takaya, Katsuhiko; and Yoneda, Haruyuki, to Asahi Kasei Kogyo Kabushiki Kaisha. Catalyst for polymerization of olefins. 4,255,280, Cl. 252-429.00B.
Salee, Gideon; and Rosenfeld, Jerold C., to Hooker Chemicals & Plastics Corp. Transesterification process for preparation of linear polyesters. 4,255,555, Cl. 528-179.000.
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Sanders, John H., to Badische Corporation. Electrically conductive textile fiber. 4,255,487, Cl. 428-368.000.
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Olschewski, Armin; Walter, Lothar; Brandenstein, Manfred; Kunkel, Heinrich; and Norlander, Gosta, 4,255,000, Cl. 308-8.200.
Sanford, Richard A.; and Dennis, William H., to Philips Petroleum Company. Chromatographic analysis without calibration using dual detectors. 4,254,656, Cl. 73-61.10C.
Sankyo Company Limited: *See—*
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Sankyo Electric Co., Ltd.: *See—*
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Santilli, Arthur A.: *See—*
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Sardella, Louis M., to Wm. C. Staley Machinery Corporation. Helical folder for paperboard blanks. 4,254,692, Cl. 493-179.000.
Sarrett, Homer J., Jr.: *See—*
Sitton, Donald M.; and Sarrett, Homer J., Jr., 4,255,270, Cl. 252-8.55D.
Sato Gosei Co., Ltd.: *See—*
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Satoh, Masatoshi, to Kioritz Corporation. Lawn trimmer. 4,254,550, Cl. 30-276.000.
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Sauer, Don R.; and Cocke, William A., to National Semiconductor Corporation. Electronic switching for AM-FM radio. 4,255,815, Cl. 455-143.000.
Sauer, Joseph; Kadelbach, Volker; and Will, Gerhard, to Robert Bosch GmbH. Method and system for upshifting an automatic transmission. 4,254,671, Cl. 74-866.000.
Saul, Franz J. Method and apparatus for producing a collapsibly foldable packaging sleeve having a polygonal cross-section. 4,255,223, Cl. 156-443.000.
Saurman, Judith B. Batik process and apparatus. 4,254,520, Cl. 8-447.000.
Savarese, Joseph, to Pozzolanic Limited. Continuous cheese making machine. 4,254,698, Cl. 99-460.000.
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Scanlon, Ray M. Removable king pin. 4,254,967, Cl. 280-433.000.
Scaramucci, Domer. Ball valve having valve chamber venting seal assemblies. 4,254,793, Cl. 137-246.220.
Schaber, Scott D., to Sperry Corporation. Hard or soft cell failure differentiator. 4,255,808, Cl. 371-38.000.
Schachter, Myron M.; and Boyer, Kenneth W., to United States of America, Health, Education and Welfare. Method and apparatus for destroying organic matter to facilitate trace inorganic element analysis. 4,255,386, Cl. 422-101.000.
Schadel, Hermann, to Holstein & Kappert GmbH. Double-seat valve. 4,254,792, Cl. 137-240.000.

Schadowski, Werner; and Bellut, Heinrich, to Jagenberg Werke Aktiengesellschaft. Process and apparatus for manufacturing sheet packaging material for containers. 4,254,693, Cl. 493-60.000.

Schafer, Hans: *See—*
Zerna, Wolfgang; Krabbe, Wilfried; and Schafer, Hans, 4,255,366, Cl. 264-35.000.

Schafer, Wolfgang: *See—*
Rigler, Josef K.; Schafer, Wolfgang; Leithauser, Horst; Trukenbrod, Karl; and Bollmann, Werner, 4,255,525, Cl. 521-57.000.

Schatzler, Walter, to Webasto-Werk W. Baier GmbH and Co. Device for a vertical and horizontal adjustment of a sliding cover for a sliding roof for a motor vehicle. 4,254,989, Cl. 296-216.000.

Schave, Richard D., to Libbey-Owens-Ford Company. Surface inspection system for detecting flatness of planar sheet materials. 4,255,055, Cl. 356-371.000.

Scheinpflug, Hans: *See—*
Kramer, Wolfgang; Buchel, Karl; Frohberger, Paul-Ernst; Brandes, Wilhelm; and Scheinpflug, Hans, 4,255,434, Cl. 424-269.000.

Schell, Klaus R., to Schweizerisches Serum-und Impfinstitut and Institut zur Erforschung der Infektionskrankheiten. Process for the preparation of a rabies vaccine and vaccine obtained by this process. 4,255,520, Cl. 435-239.000.

Schellenberger, Guenter: *See—*
Beckstein, Hellmut; and Schellenberger, Guenter, 4,255,050, Cl. 356-238.000.

Schenck, Gunther O. Multichamber UV purifying process. 4,255,383, Cl. 422-24.000.

Scher, Herbert I.; and Ungar, Israel S., to Nevamar Corporation. Abrasion-resistant laminate. 4,255,480, Cl. 428-208.000.

Schering Corporation: *See—*
Chrai, Sukhbir S.; Gupta, Santosh; and Hensley, Michael J., 4,255,415, Cl. 424-78.000.
Steinman, Martin; and Tabhaz, Pirouz, 4,255,442, Cl. 424-274.000.

Scheuermann, Horst: *See—*
Opgenorth, Hans-Joachim; Scheuermann, Horst; Laas, Harald; and Nissen, Axel, 4,255,333, Cl. 260-319.100.

Schiel, Christian, to J. M. Voith GmbH. Drying cylinder for a papermaking machine. 4,254,561, Cl. 34-124.000.

Schippers, Heinz; and Dammann, Peter, to Barmag Barmer Maschinenfabrik Aktiengesellschaft. Yarn heating apparatus. 4,255,134, Cl. 432-59.000.

Schlesinger GmbH & Co. Maschinenbau KG: *See—*
Lorenz, Reinhold, 4,255,224, Cl. 156-499.000.

Schlumberger Technology Corp.: *See—*
Havira, R. Mark, 4,255,798, Cl. 367-35.000.

Schmelzer, Heinz: *See—*
Werner, Gerhard; Schmelzer, Heinz; and Sattelmeyer, Richard, 4,255,297, Cl. 260-5.000.

Schmidt, Helmut: *See—*
Smits, Denis L.; and Schmidt, Helmut, 4,254,583, Cl. 49-246.000.

Schmidt, Paul J.; and Hung, William M., to Sterling Drug Inc. Process and intermediates for preparing 3-[4-(disubstituted-amino)phenyl] or (9-julolidinyl)-3-(diphenylamino)phthalides. 4,255,577, Cl. 546-94.000.

Schmidt, Robert H. Automatic damper means and controls therefor. 4,254,759, Cl. 126-307.00A.

Schmitjans, Josef: *See—*
Guse, Kuno; and Schmitjans, Josef, 4,254,995, Cl. 299-17.000.

Schmitt, Frederick L.: *See—*
Mussinan, Cynthia J.; Mookherjee, Braja D.; Vock, Manfred H.; Schmitt, Frederick L.; Shuster, Edward J.; Sanders, James M.; Light, Bette M.; and Granda, Edward J., 4,255,460, Cl. 426-538.000.
Sprecker, Mark A.; Hall, John B.; and Schmitt, Frederick L., 4,255,275, Cl. 252-174.110.
Wilson, Richard A.; Schreiber, William L.; Mookherjee, Braja D.; Kiwala, Jacob; Vinals, Joaquin F.; Vock, Manfred H.; Stork, Gilbert; and Schmitt, Frederick L., 4,255,293, Cl. 252-522.00R.

Schmitz, Gunter: *See—*
Langlitz, Karlheinz; and Schmitz, Gunter, 4,254,711, Cl. 105-177.000.

Schneider, Hans-D.: *See—*
Wolf, Theo; Gause, Dieter; Schneider, Hans-D.; and Gunschmann, Peter, 4,254,922, Cl. 242-194.000.

Schnurle, Hans; Drews, Ulrich; Werner, Peter; and Winkelmann, Lothar, to Robert Bosch GmbH. Apparatus for adapting engine fuel supply to ambient air temperature. 4,254,742, Cl. 123-32.0EA.

Schoeps, Jochen: *See—*
Hohlein, Peter; and Schoeps, Jochen, 4,255,530, Cl. 525-6.000.

Schoettle, Klaus; Muenzner, Wulf; Lechner, Hilmar; Woeppel, Dieter; and Gliniorz, Lothar, to BASF Aktiengesellschaft. Process and apparatus for the surface treatment of flexible magnetic recording media. 4,254,585, Cl. 51-5.00A.

Schollenberger, Charles S.; and Dinbergs, Kornelius, to B. F. Goodrich Company, The. Thermosetting polyurethane compositions. 4,255,552, Cl. 528-50.000.

Schottle, Helmut A. M., to Pitney Bowes Deutschland GmbH. Automatic plate feeding apparatus for embossing machines. 4,255,073, Cl. 414-32.000.

Schpok, Ricky K.; and Martini, Leo A., to Dresser Industries, Inc. Radial force anti-extrusion device for sealed drill string unit. 4,254,839, Cl. 175-372.000.

Schreiber, William L.: *See—*
Wilson, Richard A.; Schreiber, William L.; Mookherjee, Braja D.; Kiwala, Jacob; Vinals, Joaquin F.; Vock, Manfred H.; Stork, Gilbert; and Schmitt, Frederick L., 4,255,293, Cl. 252-522.00R.

Schroder, Johann: *See—*
Asselman, George A. A.; Schroder, Johann; and Mahdjuri, Faramarz, 4,254,820, Cl. 165-39.000.

Schroeder, Helmut H. Method for marking tight dental casting. 4,255,141, Cl. 433-68.000.

Schromm, Kurt: *See—*
Koppe, Herbert; Mentrup, Anton; Renth, Ernst-Otto; Schromm, Kurt; Hoefke, Wolfgang; and Muacevic, Gojko, 4,255,430, Cl. 424-258.000.

Schroter, Gerhard: *See—*
Baumler, Jurgen; and Schroter, Gerhard, 4,254,905, Cl. 233-26.000.

Schubert & Salzer: *See—*
Adolf, Hermann; and Grupp, Bernhard, 4,254,615, Cl. 57-96.000.

Schuller, Hans-Peter: *See—*
Coenen, Alfred; Kosswig, Kurt; Von Praun, Ferdinand; and Schuller, Hans-Peter, 4,255,356, Cl. 564-499.000.

Schulte, Hans-Gerd; and Merz, Heinz-Emil, to Polysius AG. Processes and apparatus for reducing and subsequently pelletizing moist fine-grained ore. 4,255,185, Cl. 75-36.000.

Schulz, Horst, to Zahnradfabrik Friedrichshafen Aktiengesellschaft. Tube-shaft planetary-gear transmission. 4,254,669, Cl. 74-705.000.

Schulz, Peter: *See—*
Gappa, Gunther; Juntgen, Harald; Klein, Jurgen; and Schulz, Peter, 4,255,072, Cl. 406-89.000.

Schumacher, Gunter: *See—*
Schumacher, Gustav, II; and Schumacher, Gunter, 4,254,606, Cl. 56-208.000.

Schumacher, Gustav, II; and Schumacher, Gunter. Mechanism for swiveling a machine sub-assembly. 4,254,606, Cl. 56-208.000.

Schuricht, Henry A., to AMSTED Industries Incorporated. Conveying device with object-holding stations. 4,254,861, Cl. 198-774.000.

Schuss, Werner; Klose, Hans J.; and Landgraf, Hermann, to Siemens Aktiengesellschaft. Device for releasably connecting two parts of a dental handpiece together. 4,255,143, Cl. 433-126.000.

Schuster, Michael M., to Hi Shear Corporation. Two-piece rivet. 4,254,809, Cl. 411-167.000.

Schutze, Herbert: *See—*
Fennekels, Peter; and Schutze, Herbert, 4,255,150, Cl. 8-471.000.

Schuurman, Pieter J., to Shell Oil Company. Butterfly valve. 4,254,936, Cl. 251-173.000.

Schwartz, P. Christopher; and Spielberg, Richard I., to American National Red Cross. Phasing detector for continuous flow systems. 4,255,788, Cl. 364-416.000.

Schwartz, Reinhard: *See—*
Ritter, Ernst; and Schwartz, Reinhard, 4,254,753, Cl. 123-366.000.

Schwarz, Theodore A.: *See—*
Perez, Henry S.; and Schwarz, Theodore A., 4,255,772, Cl. 360-113.000.

Schweitzer Industrial Corp.: *See—*
Carthew, Maximilian K., 4,255,132, Cl. 432-21.000.

Schweizer, Robert A.: *See—*
Coakley, Thomas A.; Rubadue, John E.; Forman, Carl E.; and Schweizer, Robert A., 4,255,317, Cl. 260-37.00N.

Schweizerisches Serum-und Impfinstitut and Institut zur Erforschung der Infektionskrankheiten: *See—*
Schell, Klaus R., 4,255,520, Cl. 435-239.000.

Schwerko, Albert P.: *See—*
Herrington, Daniel R.; Schwerko, Albert P.; Dolhyj, Serge R.; and Shaw, Wilfrid G., 4,255,253, Cl. 208-216.0PP.

Schwuger, Milan J.: *See—*
Reinwald, Elmar; Schwuger, Milan J.; Smolka, Heinz; and Krings, Peter, 4,255,148, Cl. 8-137.000.

Science Union et Cie Societe Francaise de Recherche Med.: *See—*
Morgan, Charles W., 4,255,370, Cl. 264-51.000.

Scifres, Donald R.; Streifer, William; and Burnham, Robert D., to Xerox Corporation. Monolithic multi-emitting laser device. 4,255,717, Cl. 331-94.50H.

SCM Corporation: *See—*
Turpin, Edward T., 4,255,558, Cl. 528-245.000.

Scotese, Anthony C.; Morris, Robert L.; and Santilli, Arthur A., to American Home Products Corporation. 2H-Pyrimido[4,5-d][1,3]oxazine-2,4(1H)-dione derivatives. 4,255,568, Cl. 544-91.000.

Sea Solar Power: *See—*
Anderson, J. Hilbert, 4,254,626, Cl. 60-641.000.

Searle, Robert J. G.: *See—*
Day, Janet A.; Devlin, Barry R. J.; and Searle, Robert J. G., 4,255,334, Cl. 260-326.50B.

Sedgwick, Julius P.; and Helms, Lindy. Internal lapping tool. 4,254,591, Cl. 51-355.000.

Segal, Leon; and DeBona, Bruce T., to Allied Chemical Corporation. Preparation of poly(ester carbonate) by interfacial method. 4,255,556, Cl. 528-190.000.

Seguin, Jean M. H.: *See—*
Grenier, Didier J. R.; and Seguin, Jean M. H., 4,255,674, Cl. 365-155.000.

Seiko Keiki Kabushiki Kaisha: *See—*
Komori, Haruyuki, 4,255,099, Cl. 418-97.000.

Seiter, William A.: *See—*
Levasseur, Joseph L.; Seiter, William A.; and Christensen, Calvin J., 4,254,857, Cl. 194-100.00A.

Sekine, Kenji; and Kaneko, Yoichi, to Hitachi, Ltd. Microwave integrated circuit device. 4,255,730, Cl. 333-247.000.

Sekine, Mitsuo, to Citizen Watch Company Limited. Electronic timepiece equipped with alarm function. 4,255,803, Cl. 368-72.000.

Sekiya, Setsuro: *See*—
Sumiyoshi, Masaharu; Sekiya, Setsuro; and Motosugi, Katsuhiko, 4,254,747, Cl. 123-52.00M.
Selesnick, Michael M. Apparatus for continuously controlling of the cleaning of suede and leather garments. 4,254,646, Cl. 69-30.000.
Senga, Taizo: *See*—
Nakamura, Yoshiyuki; Matsubara, Seiichi; Matsui, Takashi; Kumagai, Taiji; Senga, Taizo; and Fukutsu, Tsutomu, 4,255,184, Cl. 75-10.00R.
Sensormatic Electronics Corporation: *See*—
Humble, David R.; and Dietrich, Marlene J., 4,254,868, Cl. 206-484.000.
Sentralinstitutt for industriell forskning: *See*—
Mehlum, Even, 4,255,066, Cl. 405-76.000.
Seragnoli, Enzo, to G. D. Societa per Azioni. Variable capacity reservoir for rod shaped articles, particularly cigarettes. 4,254,858, Cl. 198-347.000.
Seredick, William D. Adjustable V-belt. 4,254,666, Cl. 474-253.000.
SES, Incorporated: *See*—
Ullery, Lee R., Jr., 4,254,546, Cl. 29-572.000.
Seta, Toshio: *See*—
Yamaguchi, Denjirou; Mogi, Noboru; Seta, Toshio; Oishi, Kunizo; Fuzimori, Yoshihisa; and Suzuki, Atsushi, 4,255,157, Cl. 44-3.00C.
Sethi, Gurdip S.: *See*—
Harvey, Frederick W.; and Sethi, Gurdip S., 4,255,034, Cl. 354-121.000.
Setoguchi, Takanoru; and Hidaka, Yoshiaki, to Nissan Motor Company, Limited. Bus bar switch for trolley-type transportation system. 4,254,851, Cl. 191-31.000.
Shames, Harold: *See*—
Shames, Sidney J.; and Shames, Harold, 4,254,914, Cl. 239-383.000.
Shames, Sidney J.; and Shames, Harold. Pulsating shower head. 4,254,914, Cl. 239-383.000.
Sharp Kabushiki Kaisha: *See*—
Kawabata, Tsuneo; Makita, Minoru; and Masuzawa, Sigeaki, 4,255,639, Cl. 219-10.55B.
Shaw, Wilfrid G.: *See*—
Herrington, Daniel R.; Schwerko, Albert P.; Dolhyj, Serge R.; and Shaw, Wilfrid G., 4,255,253, Cl. 208-216.0PP.
Shay, William, Jr., to Reed Tool Company. Drill bit insert. 4,254,840, Cl. 175-410.000.
Shell Oil Company: *See*—
Day, Janet A.; Devlin, Barry R. J.; and Searle, Robert J. G., 4,255,334, Cl. 260-326.50B.
Schuurman, Pieter J., 4,254,936, Cl. 251-173.000.
Sherer, Robert B.; and Weir, Robert M., to Whirlpool Corporation. Removable cabinet for front-servicable appliances. 4,254,640, Cl. 68-3.00R.
Sherman, Richard H.: *See*—
Gable, Melvin G.; and Sherman, Richard H., 4,255,742, Cl. 340-347.0DD.
Shiba, Haruo: *See*—
Ishida, Toshihiko; Nakazawa, Yukio; Shiba, Haruo; and Tanaka, Kimio, 4,254,923, Cl. 242-199.000.
Okamura, Masatoshi; and Shiba, Haruo, 4,254,917, Cl. 242-68.500.
Shibanai, Ichiro; Horikoshi, Kouki; and Nakamura, Nobuyuki, to Kyoshin Co., Ltd. Process for production of oil from oil sand. 4,255,249, Cl. 208-11.00R.
Shibue, Toshiaki; Nagayasu, Koichi; Mayama, Masayoshi; Ishihara, Masao; and Abe, Naoto, to Konishiroku Photo Industry Co., Ltd. Photographic films. 4,255,515, Cl. 430-495.000.
Shibuya Kogyo Company, Ltd.: *See*—
Wada, Yoshinobu; and Yoshida, Shigeru, 4,254,804, Cl. 141-40.000.
Shichman, Daniel, to Uniroyal, Inc. Nail-deflecting, inner-tube assembly for run-flat tires. 4,254,810, Cl. 152-205.000.
Shih, Frederick F.: *See*—
Rowland, Stanley P.; Blouin, Florine A.; and Shih, Frederick F., 4,255,149, Cl. 8-184.000.
Shima, Shunsuke: *See*—
Marumoto, Ryuji; Shima, Shunsuke; and Furukawa, Yoshiyasu, 4,255,565, Cl. 536-24.000.
Shimadzu Corporation: *See*—
Imamura, Naoki; Fukui, Isao; and Ono, Junichi, 4,255,051, Cl. 356-306.000.
Shimizu, Mitsuhisa: *See*—
Ohno, Kenichi; Hosomizu, Tohru; Ogawa, Rokutaro; and Shimizu, Mitsuhisa, 4,255,672, Cl. 307-455.000.
Shimotori, Kazuhiro; Nakano, Takao; and Nagayama, Yasuzi, to Mitsubishi Denki Kabushiki Kaisha. Substrate bias generator. 4,255,756, Cl. 357-51.000.
Shimoyashiki, Nobuyoshi; Masukawa, Teruo; and Imai, Fusao, to Japan Styrene Paper Corporation. Process for producing olefinic resin foams. 4,255,371, Cl. 264-54.000.
Shinzo Kitamura: *See*—
Arita, Isao; and Maede, Fumitaka, 4,254,613, Cl. 57-81.000.
Shiraimatsu Shinyaku Company, Ltd.: *See*—
Wakihira, Kazuo; Kikumoto, Satoshi; Kigawa, Hiroshi; Nozaki, Osamu; and Minami, Michio, 4,255,563, Cl. 536-8.000.
Shiraki, Masao: *See*—
Miyamoto, Noriaki; Shiraki, Masao; and Mitsuya, Kinpei, 4,254,612, Cl. 57-58.950.
Miyamoto, Noriaki; Shiraki, Masao; and Mitsuya, Kinpei, 4,254,614, Cl. 57-58.890.
Shishkin, Petr T.: *See*—
Nudelman, Boris I.; Gadaev, Anatoly Y.; Bikbau, Marsel Y.; and Shishkin, Petr T., 4,255,201, Cl. 106-106.000.
Shoberg, Harold A. Door restraint mechanism. 4,254,976, Cl. 292-292.000.
Shriner, Walter. Wearable device for monitoring momentary presence of intense X-ray and/or ultra-violet radiations. 4,255,665, Cl. 250-483.000.
Shuert, Lyle H.: *See*—
Cook, James M., III; Foy, Dennis M.; and Shuert, Lyle H., 4,254,873, Cl. 206-599.000.
Shuster, Edward J.: *See*—
Mussinan, Cynthia J.; Mookherjee, Braja D.; Vock, Manfred H.; Schmitt, Frederick L.; Shuster, Edward J.; Sanders, James M.; Light, Bette M.; and Granda, Edward J., 4,255,460, Cl. 426-538.000.
Siemens Aktiengesellschaft: *See*—
Endler, Wolfgang; and Zschauer, Karl-Heinz, 4,255,206, Cl. 148-171.000.
Friedel, Rudolf, 4,255,685, Cl. 313-330.000.
Knauer, Karl, 4,255,673, Cl. 307-221.00D.
Lehmann, Erhard; Wojtalla, Peter; and Voss, Peter, 4,255,675, Cl. 307-252.00A.
Rucha, Ulrich; and Dietze, Wolfgang, 4,255,463, Cl. 427-51.000.
Schuss, Werner; Klose, Hans J.; and Landgraf, Hermann, 4,255,143, Cl. 433-126.000.
Waterkamp, Amandus, 4,255,662, Cl. 250-416.00R.
Sigma Instruments, Inc.: *See*—
Field, John H., II, 4,255,696, Cl. 318-696.000.
Sigri Elektrographit Gesellschaft mit beschrankter Haftung: *See*—
Geiger, Wilhelm; and Swozil, Adolf, 4,255,363, Cl. 261-114.0TC.
Sih, John C., to Upjohn Company, The. 19-Hydroxy-19-methyl-6-alkoxy-PGI_1 compounds. 4,255,339, Cl. 260-346.220.
Sih, John C., to Upjohn Company, The. 2-Decarboxy-2-aminomethyl-19-hydroxy-19-methyl-6-oxo-PGF_1 compounds. 4,255,354, Cl. 564-305.000.
Siljuk, Viktor F.: *See*—
Zatsepin, Nikolai N.; Siljuk, Viktor F.; Malko, Ivan I.; Kaloshin, Valentin A.; Aniskovich, Valery M.; Naumenko, Nikolai N.; and Perfiliev, Vladimir V., 4,255,709, Cl. 324-229.000.
Simington, Jack F., to Simington Products Co. Saw mounted saw chain sharpener. 4,254,673, Cl. 76-25.00A.
Simington Products Co.: *See*—
Simington, Jack F., 4,254,673, Cl. 76-25.00A.
Siminski, Vincent; Gernand, Martin O.; and Mayer, Francis X., to Exxon Research and Engineering Co. Process for flue gas desulfurization or nitrogen oxide removal using a magnetically stabilized fluid cross-flow contactor. 4,254,616, Cl. 60-39.120.
Siminski, Vincent: *See*—
Gernand, Martin O.; Mayer, Francis X.; and Siminski, Vincent, 4,255,166, Cl. 55-3.000.
Mayer, Francis X.; Gernand, Martin O.; and Siminski, Vincent, 4,254,557, Cl. 34-1.000.
Simms, John A., to Du Pont de Nemours, E. I., and Company. Acrylic graft copolymers and coating compositions thereof. 4,255,298, Cl. 260-17.00A.
Simms, John A., to Du Pont de Nemours, E. I., and Company. Acrylic graft copolymers and coating compositions thereof. 4,255,541, Cl. 525-437.000.
Simon, Albert, to SKF Compagnie d'Applications Mechaniques. Textile twister mechanism. 4,254,611, Cl. 57-58.720.
Simon, Henry I., to Raychem Corporation. Protection of batteries. 4,255,698, Cl. 320-35.000.
Simon, Joachim; Held, Herman; and Stoye, Wilhelm. Holder for photographic processing machines. 4,255,038, Cl. 354-318.000.
Simon, Laszlo; and Frantz, Jean-Marc, to Simon, Laszlo. Installation for the storage of continuously generated coldness and for the intermittent emission of at least a portion of the stored cold. 4,254,635, Cl. 62-317.000.
Simons, Michael J.; Southby, David T.; and Ling, Hans G., to Eastman Kodak Company. Development restrainer precursors for photographic elements. 4,255,510, Cl. 430-219.000.
Simpson, Howard D., to Union Oil Company of California. Hydrotreating catalyst and process for its preparation. 4,255,282, Cl. 252-435.000.
Simpson, Peter D.: *See*—
Wright, John D.; and Simpson, Peter D., 4,254,596, Cl. 52-36.000.
Simpson, Trevor W., to Rolls-Royce Limited. Separator. 4,255,174, Cl. 55-347.000.
Sims, Anker V., to Thermo-Mist Company. Process for removing sulfur and sulfur compounds from the effluent of industrial processes. 4,255,408, Cl. 423-571.00R.
Sims, Eugene F.: *See*—
Connell, Talbert D.; and Sims, Eugene F., 4,255,641, Cl. 219-61.000.
Singer Company, The: *See*—
Friedland, Bernard, 4,255,054, Cl. 356-350.000.
Siociete d'Etudes Scientifiques et Industrielles de L'ile-de-France: *See*—
Thominet, Michel; Bulteau, Gerard; Acher, Jacques; and Colignon, Claude, 4,255,580, Cl. 546-197.000.
Sirimarco, Robert A. Ceramic heat absorption panel. 4,254,760, Cl. 126-449.000.
Sitton, Donald M.; and Sarrett, Homer J., Jr., to Phillips Petroleum Company. Characterizing petroleum sulfonates by phase behavior. 4,255,270, Cl. 252-8.55D.

Sjostrand, Sven E.: *See*—
Junggren, Ulf K.; and Sjostrand, Sven E., 4,255,431, Cl. 424-263.000.
SKF Compagnie d'Applications Mechaniques: *See*—
Simon, Albert, 4,254,611, Cl. 57-58.720.
Skifano, Anthony J.; and Bouts, Melvin L., to Plibrico Company. Skid rail insulation member and method of installing same. 4,255,127, Cl. 432-3.000.
Skillicorn, Douglas E., to B. F. Goodrich Company, The. Liquid vinylidene-terminated polymers cured with amines and thiols. 4,255,538, Cl. 525-329.000.
Skinner, Lawrence A.; and Hilton, Barney W., to Frito-Lay, Inc. Liquid-solid contacting apparatus. 4,254,699, Cl. 99-516.000.
Skinner, Winston L.: *See*—
Fersht, Rena S.; and Skinner, Winston L., 4,254,961, Cl. 277-80.000.
Skrycki, Robert R., to Ex-Cell-O Corporation. Gasket assembly. 4,254,963, Cl. 277-235.00R.
Slavin, Jury T.: *See*—
Kalinin, Viktor P.; Avdjukhin, Sergei P.; Lebedev, Vsevolod I.; Zhilin, Viktor F.; Frolov, Vladimir S.; Anisimov, Jury V.; Slavin, Jury T.; and Larionov, Valentin N., 4,255,373, Cl. 264-65.000.
Slesar, Milan; Miskovic, Vladimir; and Dudrova, Eva, to Slovenska akademia vied. Method of manufacture of sintered pressed pieces of iron reinforced by iron oxides. 4,255,193, Cl. 75-206.000.
Slovenska akademia vied: *See*—
Slesar, Milan; Miskovic, Vladimir; and Dudrova, Eva, 4,255,193, Cl. 75-206.000.
Slyman Manufacturing Corporation: *See*—
Bishilany, William J., III; Buehl, Arnold L.; and Zwipf, Werner H., 4,255,123, Cl. 431-328.000.
Small, John W.: *See*—
Noble, Walter J.; and Small, John W., 4,255,752, Cl. 343-771.000.
Smearing, Robert W., to General Electric Company. Storage stable peroxide paste composition. 4,255,277, Cl. 252-186.000.
Smedberg, Olle; and Larsson, Kenneth, to Ry Aktiebolag. Machine for treatment of lignocellulose containing board materials with gaseous agents. 4,255,102, Cl. 425-74.000.
Smit Ovens Nijmegan B.V.: *See*—
Graat, Johannes W.; and Remie, Hans T., 4,255,115, Cl. 431-10.000.
Smith, Arnold R., to Bell Telephone Laboratories, Incorporated. Methods and apparatus for automatic jumper placement. 4,254,547, Cl. 29-857.000.
Smith, Elroy C., Jr., to Rockwell International Corporation. Composite having transparent conductor pattern. 4,255,474, Cl. 428-46.000.
Smith, Fred R. Valve for self-maintaining poultry waterer. 4,254,794, Cl. 137-434.000.
Smith Kline & French Laboratories Limited: *See*—
Brown, Thomas H.; Durant, Graham J.; and Ganellin, Charon R., 4,255,428, Cl. 424-251.000.
White, George R., 4,255,425, Cl. 424-250.000.
Smith, Michael L., to Andersen Samplers Inc. Jet impaction preseparator. 4,255,172, Cl. 55-270.000.
Smith, Peter J.: *See*—
Paulson, Leland E.; and Smith, Peter J., 4,254,945, Cl. 269-102.000.
Smith, Raymond B., to Lucas Industries Limited. Method of aligning. 4,255,077, Cl. 414-786.000.
Smith, Robert K., to Gould Inc. Exterior connected arc runner for arc spinner interrupter. 4,255,631, Cl. 200-147.00R.
SmithKline Corporation: *See*—
Brush, Charles K.; and Weinstock, Joseph, 4,255,445, Cl. 424-285.000.
Rattie, Elisabeth S.; and Ravin, Louis J., 4,255,413, Cl. 424-37.000.
Weinstock, Joseph, 4,255,422, Cl. 424-244.000.
Smits, Denis L.; and Schmidt, Helmut, to Superseal Corporation. Window unit. 4,254,583, Cl. 49-246.000.
Smolka, Heinz: *See*—
Reinwald, Elmar; Schwuger, Milan J.; Smolka, Heinz; and Krings, Peter, 4,255,148, Cl. 8-137.000.
Sneider, Vincent R. Collapsible container apparatus with air vent and shut-off valve. 4,254,769, Cl. 128-227.000.
SNIA Viscosa Societa' Nazionale Industria Applicazioni Viscosa S.p.A.: *See*—
Paoletti, Ugo; and Volterra, Alessandro, 4,255,101, Cl. 425-68.000.
Snyder, Gene L.; and MacAvoy, David W., to Bendix Corporation, The. Electrical connector assembly having anti-decoupling device. 4,255,008, Cl. 339-89.00M.
Soave, Davide A. Apparatus and method for removing liners from their outer containers. 4,254,846, Cl. 182-46.000.
Societe Anonyme Francaise du Ferodo: *See*—
Dauvergne, Jean L. R., 4,254,623, Cl. 60-548.000.
Dauvergne, Jean L. R., 4,254,691, Cl. 91-467.000.
Societe Europeenne de Propulsion: *See*—
Maistre, Michel, 4,254,599, Cl. 52-224.000.
Societe Lignes Telegraphiques et Telephoniques: *See*—
Ernyei, Herbert; and Langlois, Etienne, 4,255,727, Cl. 333-197.000.
Societe Nationale des Poudres et Explosifs: *See*—
Coqueugniot, Annick G.; Bruggeman, Robert J.; and Piteau, Marc D., 4,255,243, Cl. 204-159.150.
Societe Nationale D'Etude Et De Construction De Moteurs D'Aviation: *See*—
Andre, Pierre A.; Thevenin, Jean-Claude P. H. P.; Girault, Jean-Pierre Y. B.; and Richter, Gerhard, 4,255,083, Cl. 415-119.000.
Societe Nationale Industrielle et Aerospatiale: *See*—
Mouille, Rene L.; Genoux, Gerard C. L.; Declercq, Marc A.; Leman, Jean-Luc M.; and Suzzi, Robert J., 4,255,084, Cl. 416-145.000.
Societe Suisse Pour l'Industrie Horlogere Management Services S.A.: *See*—
Jaunin, Jean-Pierre, 4,255,805, Cl. 368-108.000.
Socri International: *See*—
Rheins, Michel A., 4,255,200, Cl. 106-71.000.
Sodeco-Saia AG: *See*—
Gerber, Hermann, 4,255,681, Cl. 310-162.000.
Soderstrom, Gert. Water trap. 4,254,512, Cl. 4-191.000.
Soehngen, John W., to Celanese Corporation. Solvent stretch process for preparing microporous films from precursor films of controlled crystalline structure. 4,255,376, Cl. 264-145.000.
Soepenberg, Everhardus N., to Hoogovens IJmuiden BV. Method for making tinned steel plate free from surface graphite. 4,255,239, Cl. 204-28.000.
Sollman, Paul B., to G. D. Searle & Co. (−)-α-{2-[Bis(1-methylethyl-)amino]ethyl}-α-phenyl-2-pyridineacetamide and pharmacologically acceptable salts thereof. 4,255,582, Cl. 546-323.000.
Solodar, Arthur J.: *See*—
Williamson, Alex N.; Tremont, Samuel J.; and Solodar, Arthur J., 4,255,604, Cl. 585-428.000.
Solomin, Vladimir A.: *See*—
Popov, Alexandr D.; Solomin, Vladimir A.; and Trofimov, Vladimir A., 4,255,680, Cl. 310-13.000.
Solomon, Karl; and Hennessy, George C., to United States of America, Navy. Jam resistant frequency modulation system. 4,255,810, Cl. 375-1.000.
Solomon, Paul W., to Phillips Petroleum Company. Catalyst and process for producing ethylene oxide. 4,255,341, Cl. 260-348.340.
Sommer, Karl: *See*—
Engelbach, Heinz; Hoffmann, Harry; Palm, Peter; Sommer, Karl; and Sprague, Michael J., 4,255,285, Cl. 252-443.000.
Sonderegger, Hans C.; and Meyer, Urs B., to Kistler Instrumente AG. Balancing device. 4,255,163, Cl. 51-169.000.
Sony Corporation: *See*—
Kubota, Yukio, 4,255,768, Cl. 360-10.000.
Kubota, Yukio, 4,255,771, Cl. 360-77.000.
Ohmori, Shoji; Matsuzaki, Atsushi; and Tominaga, Kiyonori, 4,255,759, Cl. 358-19.000.
Soojian, Haig, to Ballantine Laboratories, Inc. Broadband voltmeter. 4,255,706, Cl. 324-132.000.
Souliere, Andre A. Chimney sweeping device. 4,254,528, Cl. 15-163.000.
Soundcoat Company, Inc., The: *See*—
Kirschner, Frank, 4,254,985, Cl. 295-7.000.
Southby, David T.: *See*—
Simons, Michael J.; Southby, David T.; and Ling, Hans G., 4,255,510, Cl. 430-219.000.
Southgate, Robert: *See*—
Ponsford, Roger J.; Baxter, Andrew J. G.; and Southgate, Robert, 4,255,441, Cl. 424-274.000.
Sowa, Armin; and Munding, German, to Messerschmitt-Bolkow-Blohm GmbH. Apparatus for producing fractures and gaps in geological formations for utilizing the heat of the earth. 4,254,828, Cl. 166-63.000.
Spanel, Abram N.; and Jacobs, David R., to Spanel, Abram N. Method and means of tufting. 4,254,718, Cl. 112-79.00R.
Spencer, Paul R.: *See*—
Crean, Peter A.; and Spencer, Paul R., 4,255,754, Cl. 346-75.000.
Spennes, Gunter: *See*—
Jung, Hermann; and Spennes, Gunter, 4,255,389, Cl. 422-209.000.
Sperry Corporation: *See*—
Davis, William W.; and Griffith, Ernest S., 4,255,011, Cl. 339-177.00R.
Schaber, Scott D., 4,255,808, Cl. 371-38.000.
Sperry, Peter R.: *See*—
Emmons, William D.; Sperry, Peter R.; and Kaplan, Fred A., 4,255,196, Cl. 106-29.000.
Spevack, Jerome S., to Deuterium Corporation. Contact method for multiphase processing. 4,255,410, Cl. 423-659.000.
Spielau, Paul: *See*—
Kuhnel, Werner; and Spielau, Paul, 4,255,372, Cl. 264-54.000.
Spielberg, Richard I.: *See*—
Schwartz, P. Christopher; and Spielberg, Richard I., 4,255,788, Cl. 364-416.000.
Spies, Klaus: *See*—
Koppers, Manfred; Spies, Klaus; and Bohnes, Karlheinz, 4,255,071, Cl. 405-290.000.
Spohn, Ralph J.; Ellsworth, Paul A.; and Lyford, John, IV, to Exxon Research & Engineering Co. Dual demetalling of oxo products with catalyst recycle. 4,255,279, Cl. 252-413.000.
Sprague, Michael J.: *See*—
Engelbach, Heinz; Hoffmann, Harry; Palm, Peter; Sommer, Karl; and Sprague, Michael J., 4,255,285, Cl. 252-443.000.
Sprecker, Mark A.; Hall, John B.; and Schmitt, Frederick L., to International Flavors & Fragrances Inc. Benzodioxanones and organoleptic uses thereof. 4,255,275, Cl. 252-174.110.
Springer, Donald A., to Anchor Hocking Corporation. Food preparation apparatus. 4,254,824, Cl. 165-64.000.
Squirrel S.p.A.: *See*—
Vitaloni, Alberto, 4,255,645, Cl. 219-267.000.
Stabilus GmbH: *See*—
Pohlenz, Hans, 4,254,849, Cl. 188-275.000.

Stackpole Components Company: *See*—
Campbell, Dudley H.; Daggerhart, James A.; and Overton, Arthur W., 4,255,635, Cl. 200-159.00A.
Stageberg, Wilfred E., to Minnesota Mining and Manufacturing Company. Method and apparatus for applying adhesive strip. 4,255,218, Cl. 156-238.000.
Stanadyne, Inc.: *See*—
Davis, Charles W.; and Donahue, Charles J., 4,255,097, Cl. 417-462.000.
Standard Mirror Company, Inc.: *See*—
Aikens, William R.; and Kurz, Arthur W., 4,254,931, Cl. 248-549.000.
Standard Oil Company, The: *See*—
Bartek, Joseph P.; and Grasselli, Robert K., 4,255,283, Cl. 252-437.000.
Herrington, Daniel R.; Schwerko, Albert P.; Dolhyj, Serge R.; and Shaw, Wilfrid G., 4,255,253, Cl. 208-216.0PP.
Kuch, Philip L.; and Herrington, Daniel R., 4,255,601, Cl. 585-411.000.
Standard Oil Company (Indiana): *See*—
Allen, John K., 4,255,590, Cl. 562-416.000.
Barkis, Edward; Crummer, Robert R.; and Joyner, James M., 4,255,323, Cl. 260-45.75N.
Elsdon, Ronald; and Stauffenberg, Dennis L., 4,255,598, Cl. 585-3.000.
Pappas, Peter G.; and Abdul-Malek, Adel B., 4,255,160, Cl. 44-70.000.
Rogan, John B.; and Buehler, Charles K., 4,255,281, Cl. 252-429.00B.
Wallace, Clarence W.; and Koenig, Howard A., 4,255,367, Cl. 264-45.100.
Standard Oil Company (Ohio): *See*—
Hardman, Harley F., 4,255,284, Cl. 252-437.000.
Standley, Paul M., to Dayco Corporation. Endless power transmission belt and method of making same. 4,255,146, Cl. 474-251.000.
Stanford, Ralph F.; and Christensen, Donald R., to King-Seeley Thermos Co. Ice dispensing machine having an agitator and a fixed deflector. 4,254,896, Cl. 222-108.000.
Stanley, Ada L. No tangle pet brush. 4,254,738, Cl. 119-83.000.
Stauffenberg, Dennis L.: *See*—
Elsdon, Ronald; and Stauffenberg, Dennis L., 4,255,598, Cl. 585-3.000.
Steel Heddle Manufacturing Co.: *See*—
Kaufmann, Frank H.; and Kramer, Charles F., 4,254,802, Cl. 139-91.000.
Steinbrecher, Wolfgang: *See*—
Herrmann, Wolfgang; Satzinger, Gerhard; Herrmann, Manfred; Steinbrecher, Wolfgang; and Bahrmann, Heinrich, 4,255,433, Cl. 424-267.000.
Steiner, Robert A.; and Novy, Robert A., to Prince Castle, Inc. Safety guard for food slicer. 4,254,678, Cl. 83-425.300.
Steinman, Martin; and Tabhaz, Pirouz, to Schering Corporation. 2-[(Methylsulfinyl)]-3-phenylindoles. 4,255,442, Cl. 424-274.000.
Sterling Drug Inc.: *See*—
Michne, William F., 4,255,579, Cl. 546-97.000.
Poore, Albert C. G., 4,254,871, Cl. 206-534.000.
Schmidt, Paul J.; and Hung, William M., 4,255,577, Cl. 546-94.000.
Stevens, Frank H., to A. E. Staley Manufacturing Company. Fabric-conditioning composition for article used to condition fabrics in a clothes dryer. 4,255,484, Cl. 428-286.000.
Stewart & Stevenson Services, Inc.: *See*—
Friddell, James F.; Ford, Alves T.; and Ferguson, Mike L., 4,254,752, Cl. 123-323.000.
Stinton, Frederick M., to Martin Concrete Engineering Company. System for casting and handling concrete railroad ties. 4,255,104, Cl. 425-111.000.
Stirling, John A.: *See*—
Macpherson, Ian A.; Stirling, John A.; Wheeler, Ian R.; and McCrae, James M., 4,255,375, Cl. 264-117.000.
Stock, Robert. Hollow form, polyhedron block element formed of sheet material. 4,254,574, Cl. 46-25.000.
Stocklin, Philip L., to Raytheon Company. Sonic attenuation system. 4,255,797, Cl. 367-1.000.
Stocks, Richard A., to Hestair Bettinson Limited. Seed and fertilizer metering mechanism for agricultural drilling machines. 4,254,897, Cl. 222-159.000.
Stokes, Vijay K., to General Electric Company. Variable slope bottom basket for an orbital clothes washer. 4,254,642, Cl. 68-172.000.
Stonhaus, James H. Jacking plate for trailer and the like. 4,254,927, Cl. 248-346.000.
Stork, Gilbert: *See*—
Wilson, Richard A.; Schreiber, William L.; Mookherjee, Braja D.; Kiwala, Jacob; Vinals, Joaquin F.; Vock, Manfred H.; Stork, Gilbert; and Schmitt, Frederick L., 4,255,293, Cl. 252-522.00R.
Stoye, Wilhelm: *See*—
Simon, Joachim; Held, Herman; and Stoye, Wilhelm, 4,255,038, Cl. 354-318.000.
Straitz, John F., III. Portable safety flare for combustion of waste gases. 4,255,120, Cl. 431-202.000.
Strecker, Jurgen: *See*—
Grimminger, Albert; Strecker, Jurgen; Wiedmann, Werner; and Wenning, Peter, 4,255,161, Cl. 48-86.00R.
Streifer, William: *See*—
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Oppenlaender, Knut; Strickler, Rainer; Geelhaar, Hans J.; Lamprecht, Josef; Penzel, Erich; and Ley, Gregor, 4,255,310, Cl. 260-29.60T.
Strosberg, Arthur M.: *See*—
Kluge, Arthur F.; Strosberg, Arthur M.; and Unger, Stefan H., 4,255,432, Cl. 424-267.000.
Stroupe, Stephen D.; and Moore, Edwin G., to Abbott Laboratories. Reagent and test kit for determining glycosylated hemoglobin. 4,255,385, Cl. 422-61.000.
Strussion, Thomas; and Sweigart, Kermit H. Socket support adapter. 4,254,674, Cl. 81-57.300.
Studiengesellschaft Kohle mbH: *See*—
Wilke, Gunther; Bogdanovic, Borislav; and Pauling, Horst, 4,255,595, Cl. 568-821.000.
Studio 21 (Sales) Ltd.: *See*—
Chevin, Sidney; and Fisher, Philip S., 4,255,047, Cl. 355-79.000.
Stuller, John A.: *See*—
Maxemchuk, Nicholas F.; and Stuller, John A., 4,255,763, Cl. 358-135.000.
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Suarez, Eduardo R.: *See*—
Orozco Rodriguez, Leoncio R.; Urrutia Herrera, Jose A.; and Suarez, Eduardo R., 4,255,204, Cl. 127-46.00R.
Sud-Chemie Aktiengesellschaft: *See*—
Fahn, Rudolf; and Fenderl, Nikolaus, 4,255,276, Cl. 252-184.000.
Suganuma, Kunio, to Citizen Watch Company Limited. Electronic watch. 4,255,804, Cl. 368-84.000.
Sugi, Nagatosh; and Ohishi, Tetsu, to Nippon Zeon Co. Ltd. Process for producing NBR with octyl-to decyl sulfates. 4,255,567, Cl. 526-225.000.
Sugihara, Hirosada: *See*—
Nohara, Akira; Sugihara, Hirosada; and Ukawa, Kiyoshi, 4,255,576, Cl. 546-92.000.
Sugimoto, Takeshige, to Eces Co. Ltd. Gaseous fuel containing water, apparatus therefor. 4,255,121, Cl. 431-208.000.
Sugiyama, Toshitomo: *See*—
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Suling, Carlhans; Korte, Siegfried; and Neukam, Theo, to Bayer Aktiengesellschaft. Acrylonitrile polymerization in fluorinated hydrocarbons. 4,255,546, Cl. 526-206.000.
Sumitomo Chemical Company, Limited: *See*—
Hirohara, Hideo; Nabeshima, Shigeyasu; Mitsuda, Satoshi; and Nagase, Tsuneyuki, 4,255,521, Cl. 435-234.000.
Sumiyoshi, Masaharu; Sekiya, Setsuro; and Motosugi, Katsuhiko, to Toyota Jidosha Kogyo Kabushiki Kaisha. Intake system of a multi-cylinder internal combustion engine. 4,254,747, Cl. 123-52.00M.
Sun, Jui-Yuan; Burk, Emmett H., Jr.; Yoo, Jin S.; and Masologites, George P., to Atlantic Richfield Company. Process for removal of sulfur and ash from coal. 4,255,156, Cl. 44-1.0SR.
Sun, Kai C. K.: *See*—
Morris, Lyle E.; and Sun, Kai C. K., 4,255,694, Cl. 318-565.000.
Sundstrand Corporation: *See*—
Erikson, Robert W., 4,255,093, Cl. 417-310.000.
Sunhouse Incorporated: *See*—
Zebuhr, William H., 4,254,636, Cl. 62-325.000.
Superseal Corporation: *See*—
Smits, Denis L.; and Schmidt, Helmut, 4,254,583, Cl. 49-246.000.
Suzuki, Atsushi: *See*—
Yamaguchi, Denjirou; Mogi, Noboru; Seta, Toshio; Oishi, Kunizo; Fuzimori, Yoshihisa; and Suzuki, Atsushi, 4,255,157, Cl. 44-3.00C.
Suzuki, Satomi: *See*—
Mizuno, Kiyofumi; Sato, Masanori; Maeda, Hiroaki; Takahashi, Shigeo; and Suzuki, Satomi, 4,254,672, Cl. 74-869.000.
Suzuki, Tadashi, to Sato Gosei Co., Ltd. Apparatus for molding and stretching stoppers. 4,255,111, Cl. 425-383.000.
Suzuki, Takashi: *See*—
Matsumoto, Kazuya; Matsumura, Susumu; and Suzuki, Takashi, 4,255,032, Cl. 354-53.000.
Suzuki, Takeomi; Oinoue, Kenichi; Aoki, Masahiro; Kenjyo, Hideyuki; and Ida, Masatoshi, to IOlympus Optical Co., Ltd. Method of electrically detecting focal point of cameras or the like optical devices. 4,255,654, Cl. 250-204.000.
Suzuki, Teruo; and Kuwabara, Shigeru, to Tokyo Shibaura Electric Co., Ltd. Furnace for heat treatment of wire materials. 4,255,136, Cl. 432-143.000.
Suzuki, Toshio: *See*—
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Suzuki, Tsuyoshi: *See*—
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Suzuki, Yasoji; Ochii, Kiyofumi; and Asahi, Hirozi, to Tokyo Shibaura Denki Kabushiki Kaisha. Voltage sense circuit. 4,255,678, Cl. 307-355.000.
Suzuki, Yoshiharu: *See*—
Kawai, Yoshio; Kida, Koichi; Ikarashi, Hideo; Toki, Tsukasa; and Suzuki, Yoshiharu, 4,255,592, Cl. 568-573.000.
Suzzi, Robert J.: *See*—
Mouille, Rene L.; Genoux, Gerard C. L.; Declercq, Marc A.; Leman, Jean-Luc M.; and Suzzi, Robert J., 4,255,084, Cl. 416-145.000.

Svenning, Sven, to Jonsereds AB. Loading apparatus with extension boom (telescopic boom) and with hydraulic lines carried by the boom. 4,255,076, Cl. 414-729.000.
Sverdlov, Rafail S.: *See—*
Aliev, Vagab S.; Aliev, Sakhib M. O.; Gadzhiev, Farrukh R. O.; Guseinov, Novruz I. O.; Mamedov, Shamkhal A. M. O.; Mardanov, Medzhid A.; Sverdlov, Rafail S.; and Khydyrov, Dzhavid N. O., 4,255,350, Cl. 260-453.00P.
Swan, Jack C., Jr., to Hanson Industries Inc. Viscous, flowable, pressure-compensating fitting compositions. 4,255,202, Cl. 106-122.000.
Sweigart, Kermit H.: *See—*
Strussion, Thomas; and Sweigart, Kermit H., 4,254,674, Cl. 81-57.300.
Swozil, Adolf: *See—*
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Syntex (U.S.A.) Inc.: *See—*
Jones, Gordon H.; and Young, John, 4,255,405, Cl. 424-311.000.
Kluge, Arthur F.; Strosberg, Arthur M.; and Unger, Stefan H., 4,255,432, Cl. 424-267.000.
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Ullman, Edwin F., 4,255,329, Cl. 260-239.00D.
Szymaszek, Paul G.: *See—*
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Tabhaz, Pirouz: *See—*
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Tabuchi, Toyoji: *See—*
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Takada, Sanae: *See—*
Ohyama, Hiroshi; Takada, Sanae; Watanabe, Yoshihisa; Tamura, Jyotaroh; and Taketomi, Iwao, 4,255,183, Cl. 71-120.000.
Takada, Shigeho, to Tokyo Shibaura Denki Kabushiki Kaisha. Automatic gain control circuit. 4,255,716, Cl. 330-284.000.
Takada, Shigetaka; Okamura, Masayuki; Naruse, Kazumichi; and Watanabe, Yukihiro, to Aisan Industry Co., Ltd. Air fuel ratio controller. 4,254,754, Cl. 123-437.000.
Takahashi, Sankichi: *See—*
Ogawa, Toshio; Ebara, Katsuya; and Takahashi, Sankichi, 4,255,255, Cl. 210-652.000.
Takahashi, Shigeo: *See—*
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Takami, Katsumi: *See—*
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Takano, Rikuo: *See—*
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Takara Kenzai Seisakusho & Co.: *See—*
Udagawa, Nobuo, 4,255,482, Cl. 428-215.000.
Takasaki, Yukio: *See—*
Maruyama, Eiichi; Imamura, Yoshinori; Ataka, Saburo; Inao, Kiyohisa; Takasaki, Yukio; Tsukada, Toshihisa; and Hirai, Tadaaki, 4,255,686, Cl. 313-366.000.
Takaya, Katsuhiko: *See—*
Sakurai, Hisaya; Morita, Hideo; Miya, Masayoshi; Takaya, Katsuhiko; and Yoneda, Haruyuki, 4,255,280, Cl. 252-429.00B.
Takayama, Atsumi: *See—*
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Takeda Chemical Industries, Ltd.: *See—*
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Nohara, Akira; Sugihara, Hirosada; and Ukawa, Kiyoshi, 4,255,576, Cl. 546-92.000.
Takeda, Masatoshi, to Mitsubishi Denki Kabushiki Kaisha. Control circuit of reactive power compensation apparatus. 4,255,700, Cl. 323-210.000.
Takekawa, Nobuhiro: *See—*
Koumura, Noboru; Komatsu, Toshiyuki; Nakagawa, Katsumi; Takekawa, Nobuhiro; and Fujii, Motoharu, 4,255,041, Cl. 355-3.00R.
Takenoya, Hideaki, to Janome Sewing Machine Co. Ltd. Sewing machine control mechanism. 4,254,726, Cl. 112-315.000.
Taketomi, Iwao: *See—*
Ohyama, Hiroshi; Takada, Sanae; Watanabe, Yoshihisa; Tamura, Jyotaroh; and Taketomi, Iwao, 4,255,183, Cl. 71-120.000.
Takeuchi, Yasumasa: *See—*
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Takeyasu, Kiyoo; Kato, Kanji; Goto, Tatsuo; Oouchi, Yoozoo; Yoshida, Kazuhiro; Ito, Yoshitoshi; and Takami, Katsumi, to Hitachi, Ltd. Apparatus for inspecting pipes in a plant. 4,255,762, Cl. 358-100.000.
Talbert, John W. Large mirror replication process. 4,255,364, Cl. 264-1.900.
Tamura, Jyotaroh: *See—*
Ohyama, Hiroshi; Takada, Sanae; Watanabe, Yoshihisa; Tamura, Jyotaroh; and Taketomi, Iwao, 4,255,183, Cl. 71-120.000.
Tanahashi, Toshio; and Sakai, Yoshiharu, to Toyota Jidosha Kogyo Kabushiki Kaisha. Internal combustion engine with an auxiliary combustion chamber. 4,254,750, Cl. 123-269.000.
Tanaka, Keiji: *See—*
Ohara, Katsunobu; Tanaka, Keiji; Ando, Yujiro; and Moriyama, Inao, 4,255,507, Cl. 430-53.000.
Tanaka, Kimio: *See—*
Ishida, Toshihiko; Nakazawa, Yukio; Shiba, Haruo; and Tanaka, Kimio, 4,254,923, Cl. 242-199.000.
Tanaka, Minoru; and Harihara, Ryoji, to Electric Power Development Co., Inc.; and Nagata Seisakusho Co., Ltd. Method of drying brown coal. 4,254,560, Cl. 34-12.000.
Tanaka, Minoru; Hashizume, Genzo; Matsui, Hiroshi; and Nakagawa, Satoru, to Hyogo Prefectural Government of Japan. Novel ettringite whiskers, production and uses. 4,255,398, Cl. 423-117.000.
Tanaka, Yukiyasu: *See—*
Noguchi, Masaaki; Tanaka, Yukiyasu; and Igarashi, Isao, 4,254,745, Cl. 123-51.00B.
Tanie, Kazuo; and Tachi, Susumu, to Agency of Industrial Science & Technology; and Ministry of International Trade & Industry. Apparatus for transmission of information by electrocutaneous stimuli. 4,254,776, Cl. 128-421.000.
Tanifuji, Shinya; and Morooka, Yasuo, to Hitachi, Ltd. Method for controlling furnace temperature of multi-zone heating furnace. 4,255,133, Cl. 432-24.000.
Taniguchi, Jinichi: *See—*
Kaide, Tamotsu; Gozen, Toshikazu; Taniguchi, Jinichi; and Ohta, Yutaka, 4,255,318, Cl. 260-42.180.
Tanson, Rodolphe, to Groupements d'Interets Economiques Europe-Levage-Manutention (ELMA). Automatic anti-fall device for manual or motorized lifting systems. 4,254,941, Cl. 254-267.000.
Tarlton, James K.: *See—*
Hildebrand, William G.; and Tarlton, James K., 4,254,855, Cl. 192-106.200.
Tashkentsky Nauchno-Issledovatelsky I Proektny Institut Stroitelnykh Materilov "Niistromproekt": *See—*
Nudelman, Boris I.; Gadaev, Anatoly Y.; Bikbau, Marsel Y.; and Shishkin, Petr T., 4,255,201, Cl. 106-106.000.
Tate, Ronald D.: *See—*
Phillips, William R., Jr.; and Tate, Ronald D., 4,255,089, Cl. 417-2.000.
Tateishi, Kazuyoshi: *See—*
Hoshino, Yasushi; Toida, Tooru; Tokunaga, Yukio; Tateishi, Kazuyoshi; and Takano, Rikuo, 4,255,043, Cl. 355-3.0SC.
Tatsuta, Kuniaki: *See—*
Umezawa, Sumio; Umezawa, Hamao; and Tatsuta, Kuniaki, 4,255,564, Cl. 536-17.00R.
Tayco Developments, Inc.: *See—*
Taylor, Douglas P.; and Piziali, Raymond A., 4,254,988, Cl. 296-190.000.
Taylor, Douglas P.; and Piziali, Raymond A., to Tayco Developments, Inc. Construction for isolating crane cab operator from cab movement. 4,254,988, Cl. 296-190.000.
Taylor, Michael D.: *See—*
Taylor, Milton E., III, 4,255,502, Cl. 429-163.000.
Taylor, Milton E., III, to Taylor, Michael D. Cover for automobile batteries. 4,255,502, Cl. 429-163.000.
Taylor, Peter F., to Engineering Components Limited. Filter restriction indicator. 4,254,731, Cl. 116-268.000.
TDK Electronics Company Limited: *See—*
Hamabata, Toshihiro; and Umeki, Shinji, 4,255,409, Cl. 423-632.000.
Ishida, Toshihiko; Nakazawa, Yukio; Shiba, Haruo; and Tanaka, Kimio, 4,254,923, Cl. 242-199.000.
Mikura, Chiho, 4,254,864, Cl. 206-313.000.
Okamura, Masatoshi; and Shiba, Haruo, 4,254,917, Cl. 242-68.500.
Technar Incorporated: *See—*
Bell, Lon E., 4,255,629, Cl. 200-61.45R.
Techniques Industrielles et Minieres: *See—*
Valantin, Alfred, 4,255,068, Cl. 405-195.000.
Teetz, Wolfgang; and Desprez, Alfred, to Maschinenfabrik Carl Zangs Aktiengesellschaft. Device for the intermittent interruption of the embroidery needle movement on embroidery- or sewing machines. 4,254,721, Cl. 112-221.000.
Tektronix, Inc.: *See—*
Berg, William E., 4,255,003, Cl. 339-17.0LM.
Tennant, Jerald L. Accommodating intraocular implant. 4,254,509, Cl. 3-13.000.
Tennant, Jerald L. Implant lens with biarcuate fixation. 4,254,510, Cl. 3-13.000.
Terada, Osamu; Uwajima, Takayuki; and Akita, Hiroko, to Kyowa Hakko Kogyo Co., Ltd. Glycerol oxidase and process for the production thereof. 4,255,519, Cl. 435-190.000.
Terahara, Akira: *See—*
Oka, Hidehiko; Terahara, Akira; and Endo, Akira, 4,255,444, Cl. 424-279.000.
Teramachi, Hiroshi. Limited sliding ball spline assembly. 4,254,639, Cl. 64-23.700.
Tesmann, Holger; Rutzen, Horst; and Borner, Frau E., to Henkel Kommanditgesellschaft auf Aktien (Henkel KGaA). Use of aminohydroxy acid amides as antimicrobial substances. 4,255,450, Cl. 424-320.000.
Tewes, Heinz: *See—*
Rolke, Rudi; and Tewes, Heinz, 4,254,974, Cl. 292-259.000.
Texaco Inc.: *See—*
Durkin, Joseph A., 4,255,251, Cl. 208-108.000.

Mayer, Edward A.; and Brandenburg, John T., 4,255,173, Cl. 55-329.000.
Powell, Justin C., 4,255,340, Cl. 260-346.740.
Roberts, Roy D.; and Richter, George N., 4,255,278, Cl. 252-373.000.

Texas Instruments Incorporated: *See—*
White, Lionel S., Jr.; and Blankenhorn, James C., 4,255,679, Cl. 307-355.000.

Textoris, Melvin A., to GF Business Equipment, Inc. Partition wiring system. 4,255,610, Cl. 174-48.000.

Textron, Inc.: *See—*
Lawrence, Charles T., 4,254,538, Cl. 24-205.00R.

Thagard, George F., Jr.: *See—*
Roy, Santanu, 4,255,527, Cl. 521-117.000.

Thekdi, Arvind C., to Midland-Ross Corporation. Container for baking carbon products. 4,255,128, Cl. 432-5.000.

Thermo Electron Corporation: *See—*
Matsuda, Seigo; Miskolczy, Gabor; and Dunlay, John B., 4,254,821, Cl. 165-41.000.

Thermo-Mist Company: *See—*
Sims, Anker V., 4,255,408, Cl. 423-571.00R.

Thevenin, Jean-Claude P. H. P.: *See—*
Andre, Pierre A.; Thevenin, Jean-Claude P. H. P.; Girault, Jean-Pierre Y. B.; and Richter, Gerhard, 4,255,083, Cl. 415-119.000.

Thiele, Willi; Hackmack, Klaus-Georg; and Hohm, Reinhard, to Hauni-Werke Korber & Co. KG. Method and apparatus for delivering particles of tobacco to shredding machines. 4,254,781, Cl. 131-111.000.

Thomas & Betts Corporation: *See—*
Grundfest, Michael A., 4,255,612, Cl. 174-88.00R.

Thomassen en Drijver-Verblifa N.V.: *See—*
Van Doren, Hendrik D., 4,254,886, Cl. 220-74.000.

Thominet, Michel; Bulteau, Gerard; Acher, Jacques; and Collignon, Claude, to Siociete d'Etudes Scientifiques et Industrielles de L'ile-de-France. Substituted 2,3-alkylene bis (oxy) benzamides and derivatives. 4,255,580, Cl. 546-197.000.

Thompson, Fredrick H., to Compass Electronics Corporation. Coil arrangement for search head of a metal detector. 4,255,711, Cl. 324-329.000.

Thompson, Garry W.: *See—*
Michaels, Leonard H.; Thompson, Garry W.; and Zic, Richard, 4,255,007, Cl. 339-88.00R.

Thomson-CSF: *See—*
Berger, Jean-Luc; and Coutures, Jean-Louis, 4,255,676, Cl. 307-262.000.
Berger, Jean-Luc; and Coutures, Jean-Louis, 4,255,725, Cl. 333-165.000.
Bergero, Jean-Pierre, 4,255,724, Cl. 333-17.00L.
Lecornet, Jean-Claude, 4,255,690, Cl. 315-106.000.

Thon, Wolfgang: *See—*
Fusenig, Norbert; and Thon, Wolfgang, 4,255,522, Cl. 435-297.000.

Thong, Yee H.: *See—*
Ferrante, Antonio; and Thong, Yee H., 4,255,256, Cl. 210-730.000.

Thornburg, Donald R.: *See—*
Rauch, Gary C.; Thornburg, Donald R.; and Foster, Karl, 4,255,215, Cl. 148-31.550.

Thornock, Russel L.: *See—*
Wright, Charles P.; and Thornock, Russel L., 4,254,620, Cl. 60-263.000.

Thrall Car Manufacturing Company: *See—*
Heap, James C., 4,254,714, Cl. 105-406.00R.

Threshold Technology, Inc.: *See—*
Grunza, Gene; and Herscher, Marvin B., 4,255,816, Cl. 455-277.000.

Thuillier, Jean E.: *See—*
Thuillier nee Nachmias, Germaine; Laforest nee Boutillier du Retail, Jacqueline S.; Cariou, Bernard J. M.; Bessin, Pierre A. R.; Bonnet nee Roux, Jacqueline S.; and Thuillier, Jean E., 4,255,585, Cl. 549-58.000.

Thuillier nee Nachmias, Germaine; Laforest nee Boutillier du Retail, Jacqueline S.; Cariou, Bernard J. M.; Bessin, Pierre A. R.; Bonnet nee Roux, Jacqueline S.; and Thuillier, Jean E., to Centre European de Recherches Pharmacologique. Benzoheterocyclic derivatives of phenoxyacetic acid. 4,255,585, Cl. 549-58.000.

Thyvold, Olav. Winch. 4,254,940, Cl. 254-341.000.

Timex Corporation: *See—*
Hochstrate, Paul E., 4,255,722, Cl. 331-113.00R.

Timmer, Bernardus. Method and apparatus for adapting the composition of a drilling fluid for use in making a hole in the earth by rotary drilling. 4,255,269, Cl. 252-8.50R.

Tischbirek, Guenther: *See—*
Christophliemk, Peter; Oezelli, Riza N.; and Tischbirek, Guenther, 4,255,549, Cl. 528-28.000.

Tlaker, Erich; and Nichols, Clarence M., to Fellows Corporation. Control system for machine tool with hydraulically stroked cutter. 4,254,690, Cl. 91-433.000.

Toedtli, Sergej: *See—*
Berna, Emil; and Toedtli, Sergej, 4,254,592, Cl. 51-423.000.

Tohoku University, President of: *See—*
Osa, Tetsuo; and Fujihira, Masamichi, 4,255,501, Cl. 429-111.000.

Toida, Ryuji; Sakai, Yuji; and Ikegami, Mitsuru, to Okuma Machinery Works Ltd. Multipolar resolver. 4,255,682, Cl. 310-168.000.

Toida, Tooru: *See—*
Hoshino, Yasushi; Toida, Tooru; Tokunaga, Yukio; Tateishi, Kazuyoshi; and Takano, Rikuo, 4,255,043, Cl. 355-3.0SC.

Tokai Rubber Industries, Ltd.: *See—*
Matsubara, Kentaro, 4,254,908, Cl. 238-283.000.

Toki, Tsukasa: *See—*
Kawai, Yoshio; Kida, Koichi; Ikarashi, Hideo; Toki, Tsukasa; and Suzuki, Yoshiharu, 4,255,592, Cl. 568-573.000.

Tokunaga, Yukio: *See—*
Hoshino, Yasushi; Toida, Tooru; Tokunaga, Yukio; Tateishi, Kazuyoshi; and Takano, Rikuo, 4,255,043, Cl. 355-3.0SC.

Tokyo Shibaura Denki Kabushiki Kaisha: *See—*
Nagasawa, Hiroshi, 4,255,688, Cl. 313-499.000.
Saito, Hideo, 4,255,619, Cl. 179-2.00A.
Suzuki, Yasoji; Ochii, Kiyofumi; and Asahi, Hirozi, 4,255,678, Cl. 307-355.000.
Takada, Shigeho, 4,255,716, Cl. 330-284.000.
Tsunoda, Sachio; and Nonaka, Masaharu, 4,255,078, Cl. 415-1.000.

Tokyo Shibaura Electric Co., Ltd.: *See—*
Suzuki, Teruo; and Kuwabara, Shigeru, 4,255,136, Cl. 432-143.000.

Tominaga, Kiyonori: *See—*
Ohmori, Shoji; Matsuzaki, Atsushi; and Tominaga, Kiyonori, 4,255,759, Cl. 358-19.000.

Tomlinson, Terence R.: *See—*
Isalski, Wieslaw H.; and Tomlinson, Terence R., 4,255,406, Cl. 423-359.000.

Toms River Chemical Corporation: *See—*
Olin, Arthur D., 4,255,342, Cl. 260-383.000.

Toppan Printing Co., Ltd.: *See—*
Maruyama, Takashi, 4,254,884, Cl. 215-232.000.

Toray Industries, Inc.: *See—*
Katoh, Kazunobu; Fujita, Saburo; Otaki, Toshihiro; and Nakashima, Shozi, 4,255,516, Cl. 430-533.000.

Tornkvist, Rolf G. A.: *See—*
Alpkvist, Jan A.; Tornkvist, Rolf G. A.; and Wurzig, Lars R., 4,255,122, Cl. 431-215.000.

Toshiba Ray-O-Vac Co., Ltd.: *See—*
Yoshida, Kazumasa, 4,255,498, Cl. 429-27.000.

Townsend, Donald I.: *See—*
Werling, Craig L.; and Townsend, Donald I., 4,254,741, Cl. 123-1.00A.

Toybox Corporation: *See—*
Matsumoto, Hajime; and Suzuki, Toshio, 4,254,576, Cl. 46-216.000.

Toyo Boseki Kabushiki Kaisha: *See—*
Mizumura, Yutaka; Naito, Iori; and Miyake, Hideo, 4,255,553, Cl. 528-93.000.

Toyo Ink Manufacturing Co., Ltd.: *See—*
Yamaguchi, Denjirou; Mogi, Noboru; Seta, Toshio; Oishi, Kunizo; Fuzimori, Yoshihisa; and Suzuki, Atsushi, 4,255,157, Cl. 44-3.00C.

Toyo Seikan Kaisha Limited: *See—*
Katsura, Tadahiko, 4,255,490, Cl. 428-483.000.

Toyoda Jidosha Kogyo Kabushiki Kaisha: *See—*
Nogami, Tomoyuki, 4,254,996, Cl. 303-6.00C.

Toyostar Corporation: *See—*
Matsuda, Takehiko, 4,255,637, Cl. 200-293.000.

Toyota Jidosha Kogyo Kabushiki Kaisha: *See—*
Inada, Masami; Kitamura, Kazuhiko; Ito, Shoji; Nonoyama, Takao; and Tsuji, Riichi, 4,254,938, Cl. 251-367.000.
Nogami, Tomoyuki, 4,254,997, Cl. 303-6.00C.
Noguchi, Masaaki; Tanaka, Yukiyasu; and Igarashi, Isao, 4,254,745, Cl. 123-51.00B.
Sumiyoshi, Masaharu; Sekiya, Setsuro; and Motosugi, Katsuhiko, 4,254,747, Cl. 123-52.00M.
Tanahashi, Toshio; and Sakai, Yoshiharu, 4,254,750, Cl. 123-269.000.

Tracy, David J.: *See—*
Wood, Lindley S.; Tracy, David J.; and Chakbrabarti, Paritosh M., 4,255,561, Cl. 528-388.000.

Tremblay, Michael A.: *See—*
Carau, Frank P., Sr.; Hetzel, Henry T.; and Tremblay, Michael A., 4,255,617, Cl. 178-19.000.

Tremont, Samuel J.; and Williamson, Alex N., to Monsanto Company. Stilbene fornation by means of toluene dehydrocoupling using a cobalt-lanthanide catalyst. 4,255,602, Cl. 585-428.000.

Tremont, Samuel J.: *See—*
Williamson, Alex N.; and Tremont, Samuel J., 4,255,603, Cl. 585-428.000.
Williamson, Alex N.; Tremont, Samuel J.; and Solodar, Arthur J., 4,255,604, Cl. 585-428.000.

Tricoles, Gus P.; and Rope, Eugene L., to General Dynamics/Electronics Division. Measurement of radiant energy scattering characteristics with a turntable-type scanning apparatus. 4,255,702, Cl. 324-58.00B.

Trofimov, Vladimir A.: *See—*
Popov, Alexandr D.; Solomin, Vladimir A.; and Trofimov, Vladimir A., 4,255,680, Cl. 310-13.000.

Trogan, John F., to C. G. Bretting Mfg. Co. Inc. Sheet overlap device. 4,254,947, Cl. 270-39.000.

Trotta, Richard L. Heat source for food warming unit. 4,255,117, Cl. 431-34.000.

Trukenbrod, Karl: *See—*
Rigler, Josef K.; Schafer, Wolfgang; Leithauser, Horst; Trukenbrod, Karl; and Bollmann, Werner, 4,255,525, Cl. 521-57.000.

Trumble, William P.: *See—*
Pacey, Grant K.; Hughes, Ronald F.; Trumble, William P.; and Lukas, Helmut H., 4,254,865, Cl. 206-316.000.

TRW Inc.: *See*—
Michaels, Leonard H.; Thompson, Garry W.; and Zic, Richard, 4,255,007, Cl. 339-88.00R.
Tse, Harold F., to Engelhard Minerals & Chemicals Corporation. Improved para- and ortho-xylene isomerization by adding pentane. 4,255,606, Cl. 585-482.000.
Tsubata, Noritaka, to Yoshida Kogyo K K. Woven stringer for slide fasteners. 4,254,803, Cl. 139-384.00B.
Tsuji, Riichi: *See*—
Inada, Masami; Kitamura, Kazuhiko; Ito, Shoji; Nonoyama, Takao; and Tsuji, Riichi, 4,254,938, Cl. 251-367.000.
Tsujino, Nobuyuki: *See*—
Hirano, Shigeo; Adachi, Keiichi; and Tsujino, Nobuyuki, 4,255,511, Cl. 430-217.000.
Tsukada, Toshihisa: *See*—
Maruyama, Eiichi; Imamura, Yoshinori; Ataka, Saburo; Inao, Kiyohisa; Takasaki, Yukio; Tsukada, Toshihisa; and Hirai, Tadaaki, 4,255,686, Cl. 313-366.000.
Tsunoda, Sachio; and Nonaka, Masaharu, to Tokyo Shibaura Denki Kabushiki Kaisha. Method of controlling operation of multistage hydraulic machines. 4,255,078, Cl. 415-1.000.
Tucek, Frank J., to J. I. Case Company. Tree harvesting apparatus and method. 4,254,807, Cl. 144-34.00E.
Tucker, Robert J., to American Cyanamid Company. Nickel stabilizers and dye enhancers for polyolefins. 4,255,304, Cl. 260-23.00H.
Turi, Edith A.: *See*—
Baughman, Ray H.; Turi, Edith A.; Preziosi, Anthony F.; and Yee, Kwok-Chun, 4,255,535, Cl. 525-129.000.
Turnbull, Fred G.: *See*—
Plunkett, Allan B.; and Turnbull, Fred G., 4,255,695, Cl. 318-723.000.
Turner, Charles W.: *See*—
Blundell, Stephen J.; and Turner, Charles W., 4,255,660, Cl. 250-370.000.
Turpin, Edward T., to SCM Corporation. Self-curing thermosetting powder paints. 4,255,558, Cl. 528-245.000.
Ty, Perla J. Hypodermic syringe. 4,254,768, Cl. 128-218.00M.
Tybar Engineering Pty. Ltd.: *See*—
Bartlett, Ian G.; Barron, Arthur D.; Lymer, Donald A.; and McKendrick, George A. R., 4,254,644, Cl. 68-205.00R.
Tyndale Plains - Hunter Ltd.: *See*—
Gould, Francis E., 4,255,550, Cl. 528-44.000.
Udagawa, Nobuo, to Takara Kenzai Seisakusho & Co. Vibration-absorbing fire-resisting floor for vehicles, vessels or the like. 4,255,482, Cl. 428-215.000.
Udipi, Kishore, to Phillips Petroleum Company. Azodicarboxylate-modified copolymers. 4,255,536, Cl. 525-314.000.
Ukawa, Kiyoshi: *See*—
Nohara, Akira; Sugihara, Hirosada; and Ukawa, Kiyoshi, 4,255,576, Cl. 546-92.000.
Ukihashi, Hiroshi; Asawa, Tatsuro; and Gunjima, Tomoki, to Asahi Glass Company, Limited. Cation exchange membrane of fluorinated polymer for electrolysis and preparation thereof. 4,255,523, Cl. 521-27.000.
Ullery, Lee R., Jr., to SES, Incorporated. Photovoltaic cell array. 4,254,546, Cl. 29-572.000.
Ullman, Edwin F., to Syva Company. Double receptor fluorescent immunoassay. 4,255,329, Cl. 260-239.00D.
Ulrich, Reinhard; and Rashleigh, Scott C., to Max-Planck-Gesellschaft zur Forderung der Wissenschaften e.V. Fibre optical arrangement for measuring the intensity of an electric current. 4,255,018, Cl. 350-375.000.
Ulseth, John W.: *See*—
Giorgini, Norman L.; and Ulseth, John W., 4,255,650, Cl. 235-91.00R.
Umeki, Shinji: *See*—
Hamabata, Toshihiro; and Umeki, Shinji, 4,255,409, Cl. 423-632.000.
Umezawa, Hamao: *See*—
Umezawa, Sumio; Umezawa, Hamao; and Tatsuta, Kuniaki, 4,255,564, Cl. 536-17.00R.
Umezawa, Sumio; Umezawa, Hamao; and Tatsuta, Kuniaki, to Zaidan Hojin Biseibutsu Kagaku Kenkyu Kai. Novel macrolactone derivatives and process of producing them. 4,255,564, Cl. 536-17.00R.
Ungar, Israel S.: *See*—
Scher, Herbert I.; and Ungar, Israel S., 4,255,480, Cl. 428-208.000.
Unger, Stefan H.: *See*—
Kluge, Arthur F.; Strosberg, Arthur M.; and Unger, Stefan H., 4,255,432, Cl. 424-267.000.
Union Carbide Corporation: *See*—
Beatty, Theodore R., 4,255,499, Cl. 429-54.000.
Brown, Gary L.; Warner, David F.; and Byon, Jae H., 4,255,542, Cl. 526-88.000.
Herdle, William B.; and Kanner, Bernard, 4,255,348, Cl. 556-410.000.
Keogh, Michael J., 4,255,303, Cl. 260-23.00H.
Olabisi, Olagoke, 4,255,368, Cl. 264-45.500.
Olszewski, Walter J., 4,254,629, Cl. 62-13.000.
Peters, Edward N., 4,255,319, Cl. 260-45.70P.
Union Oil Company of California: *See*—
Simpson, Howard D., 4,255,282, Cl. 252-435.000.
Uniroyal, Inc.: *See*—
Shichman, Daniel, 4,254,810, Cl. 152-205.000.
United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Defence in Her Britannic Majesty's Government of the: *See*—
Jones, Ronald H.; and Pryde, Alexander W. H., 4,255,358, Cl. 568-931.000.
U.S. Filter Corporation: *See*—
O'Cheskey, Theodore H.; and Bunker, Carroll C., 4,255,262, Cl. 210-221.200.
United States of America
Agriculture: *See*—
Rowland, Stanley P.; Blouin, Florine A.; and Shih, Frederick F., 4,255,149, Cl. 8-184.000.
Air Force: *See*—
Crane, Robert L., 4,255,478, Cl. 428-113.000.
Richter, Robert F., 4,254,688, Cl. 91-365.000.
Army: *See*—
Petrick, Ernest N., 4,254,970, Cl. 280-705.000.
Vig, John R., 4,255,228, Cl. 156-623.00Q.
Energy: *See*—
Brunsden, Barry S., 4,255,021, Cl. 350-286.000.
Nakamura, Michiyuki, 4,255,793, Cl. 364-701.000.
Health, Education and Welfare: *See*—
Boretos, John W., 4,254,774, Cl. 128-348.000.
McCully, Kilmer S., 4,255,443, Cl. 424-275.000.
Schachter, Myron M.; and Boyer, Kenneth W., 4,255,386, Cl. 422-101.000.
Interior: *See*—
Guay, Paul J., 4,254,710, Cl. 104-165.000.
National Aeronautics and Space Administration: *See*—
Franke, John M., 4,255,048, Cl. 356-28.500.
Levine, Stanley R.; Miller, Robert A.; and Hodge, Philip E., 4,255,495, Cl. 428-632.000.
Navy: *See*—
Adams, Leo G.; and Hoffman, Richard E., 4,255,302, Cl. 260-18.0EP.
Birx, Daniel L., 4,255,731, Cl. 333-258.000.
Borkat, Franklin R.; and Kataoka, Richard W., 4,255,653, Cl. 235-495.000.
Huang, Kwang T.; and Milner, Brian R., 4,255,615, Cl. 174-140.0CR.
Laing, Joseph T., 4,255,799, Cl. 367-96.000.
Malakhoff, Alexander, 4,254,842, Cl. 180-126.000.
Solomon, Karl; and Hennessy, George C., 4,255,810, Cl. 375-1.000.
U.S. Philips Corporation: *See*—
Asselman, George A. A.; Schroder, Johann; and Mahdjuri, Faramarz, 4,254,820, Cl. 165-39.000.
Boonstra, Lieuwe; Lambrechtse, Cornelis W.; Salters, Roelof H. W.; and Wijnhoven, Rene M. G., 4,255,677, Cl. 307-304.000.
Grenier, Didier J. R.; and Seguin, Jean M. H., 4,255,674, Cl. 365-155.000.
van Engelen, Hielke A.; and Willemsen, Petrus J. M., 4,255,687, Cl. 313-488.000.
Van Tol, Nicolaas, 4,255,738, Cl. 340-46.000.
United States Steel Corporation: *See*—
Anspon, Harry D., 4,255,315, Cl. 260-33.6AQ.
United Technologies Corporation: *See*—
Messer, Gordon J., 4,255,783, Cl. 363-96.000.
University of California, The Regents of the: *See*—
Chappell, Terry I.; and White, Richard M., 4,255,212, Cl. 148-1.500.
Kaufman, Leon; and Hosier, Kenneth E., Jr., 4,255,659, Cl. 250-370.000.
UOP Inc.: *See*—
Flagg, John F.; and Antos, George J., 4,255,290, Cl. 252-466.00B.
Upjohn Company, The: *See*—
Axen, Udo F., 4,255,355, Cl. 564-305.000.
Sih, John C., 4,255,339, Cl. 260-346.220.
Sih, John C., 4,255,354, Cl. 564-305.000.
Urad Predsednictva Slovenskej Akademie: *See*—
Berek, Dusan; and Novak, Ivan, 4,255,286, Cl. 252-448.000.
Urban, Joseph J., to Hoechst-Roussel Pharmaceuticals Inc. Ampul. 4,254,883, Cl. 215-32.000.
Uriarte del Rio, Juan; and Jimenez-Alfaro, Jose. Double barrelled firearm. 4,254,570, Cl. 42-2.000.
Urrutia Herrera, Jose A.: *See*—
Orozco Rodriguez, Leoncio R.; Urrutia Herrera, Jose A.; and Suarez, Eduardo R., 4,255,204, Cl. 127-46.00R.
USM Corporation: *See*—
Hold, Peter; Tadmor, Zehev; and Valsamis, Lefteris N., 4,255,059, Cl. 366-97.000.
Uwajima, Takayuki: *See*—
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van Engelen, Hielke A.; and Willemsen, Petrus J. M., to U.S. Philips Corporation. Low pressure mercury vapor discharge lamp. 4,255,687, Cl. 313-488.000.

van Heijst, Willem J., to Bluewater Terminal Systems N.V. Single-point mooring buoy. 4,254,522, Cl. 9-8.00P.

van Lit, Klaas J., to S. C. Johnson & Son, Inc. Self-aligning aerosol dispensing device. 4,254,899, Cl. 222-402.130.

van Mansvelt, C. Friso; Ritter, Hansruedi; and Eicher, Walter, to Contraves AG. Theodolite for tracking and measuring a flying object with a TV camera arranged at a telescope. 4,255,765, Cl. 358-225.000.

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Harms, Wolfgang; Wunderlich, Klaus; and van Oertzen, Klaus, 4,255,325, Cl. 260-146.00T.

van Rensen, Enno: *See*—
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Van Tol, Nicolaas, to U.S. Philips Corporation. Device for detecting unwanted signal combinations of two signal lamps in traffic lights. 4,255,738, Cl. 340-46.000.

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Franks, Neal E.; and Varga, Julianna K., 4,255,300, Cl. 260-17.4CL.

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Varta Batterie, A.G.: *See*—
Jung, Margarete, 4,255,503, Cl. 429-201.000.

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Harris, Richard W.; Cleveland, John F.; and Lott, Thomas M., 4,255,620, Cl. 179-15.55R.

VDO Adolf Schindling AG: *See*—
Collonia, Harald, 4,254,844, Cl. 180-179.000.
Lang, Wilhelm-Ludwig, 4,255,739, Cl. 340-52.00F.

VEB Berlin-Chemie: *See*—
Bergfeld, Jost; Raasch, Marie-Luise; Konig, Ingo; and Brussow, Klaus-Peter, 4,255,420, Cl. 424-177.000.

Veba Oel AG: *See*—
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Grill, Michael; and Grohmann, Helmut, 4,255,399, Cl. 423-164.000.

Velsicol Chemical Corporation: *See*—
Krenzer, John, 4,255,182, Cl. 71-90.000.
Paul, Kalidas; and Kyker, Glendon D., 4,255,597, Cl. 570-220.000.

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Rickert, Hans; and Holzapfel, Gunter, 4,255,647, Cl. 219-322.000.

Vick, James A.; and Castner, Charles S. Methods and apparatus for collecting bee venom. 4,254,519, Cl. 6-12.00R.

Vidal, Claude A., to American Hospital Supply Corporation. Folded top urine bag with elongated stiffening panel. 4,254,771, Cl. 128-275.000.

Vig, John R., to United States of America, Army. Method of growing quartz. 4,255,228, Cl. 156-623.00Q.

Vilter Manufacturing Corporation: *See*—
Brauch, Paul J.; and Szymaszek, Paul G., 4,254,637, Cl. 62-468.000.

Vinals, Joaquin F.: *See*—
Wilson, Richard A.; Schreiber, William L.; Mookherjee, Braja D.; Kiwala, Jacob; Vinals, Joaquin F.; Vock, Manfred H.; Stork, Gilbert; and Schmitt, Frederick L., 4,255,293, Cl. 252-522.00R.

Vitaloni, Alberto, to Squirrel S.p.A. Electric cigarette-lighter device. 4,255,645, Cl. 219-267.000.

Vock, Manfred H.: *See*—
Mussinan, Cynthia J.; Mookherjee, Braja D.; Vock, Manfred H.; Schmitt, Frederick L.; Shuster, Edward J.; Sanders, James M.; Light, Bette M.; and Granda, Edward J., 4,255,460, Cl. 426-538.000.
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Freudenschuss, Otto, 4,255,029, Cl. 354-25.000.

Vogel, Walter H.; and Close, Thomas E., to Redington Inc. Cartoner and product infeed conveyor therefor. 4,254,604, Cl. 53-566.000.

Voith Turbo GmbH & Co. KG: *See*—
Wahl, Georg, 4,255,170, Cl. 55-185.000.

Volterra, Alessandro: *See*—
Paoletti, Ugo; and Volterra, Alessandro, 4,255,101, Cl. 425-68.000.

Vonder, David L., to GTE Automatic Electric Laboratories Incorporated. Cam actuated switching device. 4,255,634, Cl. 200-153.0LA.

von Matern, Sten; and Fredriksson, Rune O. W., to Avesta Jernverks Aktiebolag. Framework for a basket for heat treating at high temperatures, and a method for manufacturing the same. 4,254,944, Cl. 266-275.000.

Von Praun, Ferdinand: *See*—
Coenen, Alfred; Kosswig, Kurt; Von Praun, Ferdinand; and Schuller, Hans-Peter, 4,255,356, Cl. 564-499.000.

Voss, Peter: *See*—
Lehmann, Erhard; Wojtalla, Peter; and Voss, Peter, 4,255,675, Cl. 307-252.00A.

W. R. Grace & Co.: *See*—
Block, Jacob, 4,255,268, Cl. 252-8.50B.

Waag, Lars A. S.: *See*—
Cederqvist, Nils G.; Hellsten, Karl M. E.; Henriksson, Kerstin E.; and Waag, Lars A. S., 4,254,823, Cl. 165-55.000.

Wackerle, Peter M.; Brunsch, Klaus; and Grober, Josef, to Messerschmitt-Bolkow-Blohm GmbH. Member formed of fiber-reinforced plastic material, such as a rotor blade. 4,255,087, Cl. 416-230.000.

Wada, Yoshinobu; and Yoshida, Shigeru, to Shibuya Kogyo Company, Ltd. Filling device for filling containers. 4,254,804, Cl. 141-40.000.

Wafer, John A.; Koren, Paul P.; and Meyer, Thomas N., to Westinghouse Electric Corp. Circuit breaker with current carrying conductor system utilizing eddy current repulsion. 4,255,636, Cl. 200-250.000.

Wafer, John A.; Bratkowski, Walter V.; and Lang, Walter W., to Westinghouse Electric Corp. Current limiting circuit breaker. 4,255,732, Cl. 335-16.000.

Wagner, Kuno: *See*—
Mohring, Edgar; Muller, Hanns P.; and Wagner, Kuno, 4,255,529, Cl. 521-158.000.

Wahl, Georg, to Voith Turbo GmbH & Co. KG. Venting device for the housing of a rotary machine. 4,255,170, Cl. 55-185.000.

Wakihira, Kazuo; Kikumoto, Satoshi; Kigawa, Hiroshi; Nozaki, Osamu; and Minami, Michio, to Shiraimatsu Shinyaku Company, Ltd. Process for preparing anthocyans from corresponding flavonoid glycosides. 4,255,563, Cl. 536-8.000.

Waldbillig, Charles C., to Medex Inc. Swivel coupling for a catheterization system. 4,254,773, Cl. 128-348.000.

Walker, James R.: *See*—
Armitage, John D., Jr.; Barkley, John A.; Hooker, Ross B., III; and Walker, James R., 4,255,042, Cl. 355-3.00R.

Wallace, Clarence W.; and Koenig, Howard A., to Standard Oil Company (Indiana). Method for injection molding articles wherein additives are added in selective portions. 4,255,367, Cl. 264-45.100.

Walter, Lothar: *See*—
Olschewski, Armin; Walter, Lothar; Brandenstein, Manfred; Kunkel, Heinrich; and Norlander, Gosta, 4,255,000, Cl. 308-8.200.

Walters, Peter E.: *See*—
Clow, Hugh; Walters, Peter E.; and Percival, Wiliam S., 4,254,778, Cl. 128-653.000.

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Hager, Walter; and Walther, Karl-Heinz, 4,254,725, Cl. 112-292.000.

Walton, Richard A.; and Mocko, John, Jr., to GTE Automatic Electric Laboratories Incorporated. Call processing monitor system. 4,255,624, Cl. 179-175.20D.

Walton, Richard A.; and Mocko, John, Jr., to GTE Automatic Electric Laboratories Incorporated. Call processing monitor system. 4,255,625, Cl. 179-175.20D.

Wang, Shih-Ping; and Robbins, Charles D., to Diagnostic Information, Inc. Two stage, panel type x-ray image intensifier tube. 4,255,666, Cl. 250-486.000.

Wang, Shing C.; and Hamerdinger, Randolph W., to Xerox Corporation. Variable diameter segmented hollow cathode laser device. 4,255,720, Cl. 331-94.50G.

Warheit, Kevin E.: *See*—
Hough, William V.; Little, John L.; and Warheit, Kevin E., 4,255,194, Cl. 106-1.240.

Warner, David F.: *See*—
Brown, Gary L.; Warner, David F.; and Byon, Jae H., 4,255,542, Cl. 526-88.000.

Warren, Ernest W. Drain pipe hanger. 4,254,930, Cl. 248-542.000.

Watanabe, Isamu; Iwasaki, Akio; and Mori, Toshihito, to Kowa Company, Ltd. Fortimicin aminoglycosides, process for production thereof, and use thereof. 4,255,421, Cl. 424-180.000.

Watanabe, Kenkichi; and Furuya, Katusuke, to Laurel Bank Machine Co., Ltd. Coin accumulation cylinder changeover alarm. 4,254,787, Cl. 133-8.00A.

Watanabe, Yoshihisa: *See*—
Ohyama, Hiroshi; Takada, Sanae; Watanabe, Yoshihisa; Tamura, Jyotaroh; and Taketomi, Iwao, 4,255,183, Cl. 71-120.000.

Watanabe, Yukihiro: *See*—
Takada, Shigetaka; Okamura, Masayuki; Naruse, Kazumichi; and Watanabe, Yukihiro, 4,254,754, Cl. 123-437.000.

Waterkamp, Amandus, to Siemens Aktiengesellschaft. X-ray diagnostic apparatus having operating keys for the organwise programmed setting of exposure data. 4,255,662, Cl. 250-416.00R.

Watkins, Fred E., to Camco, Incorporated. Well locking device. 4,254,829, Cl. 166-134.000.

Watkins, Thomas I.; and Weighton, David M., to Boots Company Limited, The. Triazole compounds. 4,255,435, Cl. 424-269.000.

Watts, Roger E.; Wright, William W.; and Donarski, William J., to Guardian Electric Manufacturing Company. Multiple position switch. 4,255,626, Cl. 200-6.00A.

Weaver, Max A.: *See*—
Giles, Ralph R.; and Weaver, Max A., 4,255,326, Cl. 260-152.000.

Webasto-Werk W. Baier GmbH and Co.: *See*—
Schatzler, Walter, 4,254,989, Cl. 296-216.000.

Weber, Harold J., to Coulter Systems Corporation. High speed electrically responsive indicia detecting apparatus and method. 4,255,652, Cl. 235-451.000.

Weber, Harold J. Plural search frequency directional metal detector apparatus having enhanced sensitivity. 4,255,710, Cl. 324-328.000.

Wehr Corporation: *See*—
Dravnieks, Konstantins, 4,255,171, Cl. 55-269.000.
McNabney, John C., 4,254,795, Cl. 137-454.600.

Wei, Yu W.: *See*—
Makin, Earle C.; Price, Jerry L.; and Wei, Yu W., 4,255,591, Cl. 562-517.000.

Weighton, David M.: *See*—
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Weigl, John W.; Reilich, William M.; and Mailloux, Louis D., to Xerox Corporation. Positive overlay electronic xerographic printer. 4,255,040, Cl. 355-3.00R.

Weinstock, Joseph, to SmithKline Corporation. 6-Halo-7,8-dihydroxy-1-phenyl-2,3,4,5-tetrahydro-1H-3-benzazepines. 4,255,422, Cl. 424-244.000.

Weinstock, Joseph: *See*—
Brush, Charles K.; and Weinstock, Joseph, 4,255,445, Cl. 424-285.000.

Weir, Robert M.: *See*—
Sherer, Robert B.; and Weir, Robert M., 4,254,640, Cl. 68-3.00R.

Weiss, Robert A., to Exxon Research & Engineering Co. Neutralized phosphonated elastomeric polymers. 4,255,540, Cl. 525-332.000.

Weissman, Bernard, to IPCO Hospital Supply Corporation. Dental tool having severable sections. 4,255,145, Cl. 433-165.000.

Weith, Andre: *See*—
Albert, Alban; Courbat, Pierre; and Weith, Andre, 4,255,336, Cl. 260-345.200.

Welch, Kenneth R.: *See*—
Barnes, Larry A.; Daugherty, Daniel; Flynn, Michael D.; Robertson, Michael D.; and Welch, Kenneth R., 4,255,623, Cl. 179-175.20A.

Wells, John R.: *See*—
Hoehn, Harvey H.; and Wells, John R., 4,255,267, Cl. 210-678.000.

Wells, William T. Fireplace apparatus. 4,254,756, Cl. 126-121.000.

Wenning, Peter: *See*—
Grimminger, Albert; Strecker, Jurgen; Wiedmann, Werner; and Wenning, Peter, 4,255,161, Cl. 48-86.00R.

Werling, Craig L.; and Townsend, Donald I., to Dow Chemical Company, The. Diesel engine with dual fuel injection system and method of operation. 4,254,741, Cl. 123-1.00A.

Werner, Gerhard; Schmelzer, Heinz; and Sattelmeyer, Richard, to Hoechst Aktiengesellschaft. Adhesive binding agents and adhesives containing them. 4,255,297, Cl. 260-5.000.

Werner, Lincoln H., to Ciba-Geigy Corporation. N-Quinazolinyl-piperidinyl-lactams. 4,255,429, Cl. 424-251.000.

Werner, Peter: *See*—
Schnurle, Hans; Drews, Ulrich; Werner, Peter; and Winkelmann, Lothar, 4,254,742, Cl. 123-32.0EA.

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Grimminger, Albert; Strecker, Jurgen; Wiedmann, Werner; and Wenning, Peter, 4,255,161, Cl. 48-86.00R.

Westbay Instruments Ltd.: *See*—
Patton, Franklin D.; and McFarlane, James D., 4,254,832, Cl. 166-332.000.

Westberg, Johan E. H., to AGA Aktiebolag. Apparatus for mixing media, such as gases or liquids. 4,254,789, Cl. 137-88.000.

Western Electric Company, Inc.: *See*—
Dinella, Donald; and Wong, Ching-Ping, 4,255,481, Cl. 428-209.000.
Meal, John R., 4,255,779, Cl. 361-308.000.

Westinghouse Electric Corp.: *See*—
Chen, Cheng-lin, 4,255,404, Cl. 423-258.000.
Chiang, Peter T., 4,255,393, Cl. 423-15.000.
Hoffmann, Arthur G.; Guberman, Robert P.; and Horner, Larry E., 4,255,787, Cl. 364-494.000.
Johnston, Robert J.; Layciak, Stephen G.; and Cametti, George M., 4,255,633, Cl. 200-153.00J.
Liotino, Vito A., 4,255,616, Cl. 174-151.000.
Livera, Phillip A., 4,255,642, Cl. 219-68.000.
Miller, Robert C., 4,255,707, Cl. 324-142.000.
Neuner, James A.; and Oates, Robert M., 4,255,234, Cl. 176-19.00R.
Rauch, Gary C.; Thornburg, Donald R.; and Foster, Karl, 4,255,215, Cl. 148-31.550.
Rosa, John, 4,255,784, Cl. 363-129.000.
Wafer, John A.; Koren, Paul P.; and Meyer, Thomas N., 4,255,636, Cl. 200-250.000.
Wafer, John A.; Bratkowski, Walter V.; and Lang, Walter W., 4,255,732, Cl. 335-16.000.

Westphal, Teddy M., to Boise Cascade Corporation. Non-sliver scored metal end. 4,254,890, Cl. 220-276.000.

Wheelabrator-Frye Inc.: *See*—
Leliaert, Raymond M.; Lindner, Robert N.; and Davidson, James K., 4,255,169, Cl. 55-97.000.

Wheeler, Ian R.: *See*—
Macpherson, Ian A.; Stirling, John A.; Wheeler, Ian R.; and McCrae, James M., 4,255,375, Cl. 264-117.000.

Wheeler, Ralph. Baby lift carrier and pad assembly. 4,254,900, Cl. 224-158.000.

Whirlpool Corporation: *See*—
Gauer, Joseph A.; and Kennedy, William L., 4,254,641, Cl. 68-23.700.
Sherer, Robert B.; and Weir, Robert M., 4,254,640, Cl. 68-3.00R.

White, George R., to Smith Kline & French Laboratories Limited. Sulphoxides. 4,255,425, Cl. 424-250.000.

White, Kenneth R.; and Hancock, John P., to K-Whit Tools Incorporated. Refillable gas burning lighter. 4,255,119, Cl. 431-150.000.

White, Lionel S., Jr.; and Blankenhorn, James C., to Texas Instruments Incorporated. Depletion load dynamic sense amplifier for MOS random access memory. 4,255,679, Cl. 307-355.000.

White Motor Corporation of Canada Limited: *See*—
Powell, Thomas E.; Donaldson, Edward; and McNeil, Ronald F., 4,254,780, Cl. 130-27.00T.

White, Richard M.: *See*—
Chappell, Terry I.; and White, Richard M., 4,255,212, Cl. 148-1.500.

Whiteside, George D.: *See*—
Johnson, Bruce K.; and Whiteside, George D., 4,255,030, Cl. 354-27.000.
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Whitney, Ruby D. Container assembly. 4,254,902, Cl. 229-28.00R.

Wiba AG: *See*—
Baumann, Rene, 4,254,950, Cl. 272-130.000.

WIBAU Industrie und Verwaltung GmbH: *See*—
Peleschka, Gerhart; and Sallmann, Dieter, 4,255,058, Cl. 366-25.000.

Wiedenbeck, Roger D.; Boughton, Kenneth W.; and Maurer, Richard, to Johnson Corporation, The. Stainless steel rotary joint. 4,254,972, Cl. 285-61.000.

Wiedmann, Werner: *See*—
Grimminger, Albert; Strecker, Jurgen; Wiedmann, Werner; and Wenning, Peter, 4,255,161, Cl. 48-86.00R.

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Boonstra, Lieuwe; Lambrechtse, Cornelis W.; Salters, Roelof H. W.; and Wijnhoven, Rene M. G., 4,255,677, Cl. 307-304.000.

Wilke, Gunther; Bogdanovic, Borislav; and Pauling, Horst, to Studiengesellschaft Kohle mbH. Optically active cyclooctenyl ethyl alcohol. 4,255,595, Cl. 568-821.000.

Wilkins, O. DuWayne, to American Air Filter Company, Inc. Gas separation filter device having a handle. 4,255,175, Cl. 55-357.000.

Will, Gerhard: *See*—
Sauer, Joseph; Kadelbach, Volker; and Will, Gerhard, 4,254,671, Cl. 74-866.000.

Willemsen, Petrus J. M.: *See*—
van Engelen, Hielke A.; and Willemsen, Petrus J. M., 4,255,687, Cl. 313-488.000.

Wm. C. Staley Machinery Corporation: *See*—
Sardella, Louis M., 4,254,692, Cl. 493-179.000.

Williams, Charles J., to Perkin-Elmer Corporation, The. Method for determining quality of U.S. currency. 4,255,057, Cl. 356-435.000.

Williams, Louis B., Jr., to Monsanto Company. Metered finish. 4,255,472, Cl. 427-445.000.

Williams, Louis B., Jr., to Monsanto Company. Metered finish. 4,255,473, Cl. 427-445.000.

Williams, Robert E.: *See*—
Kuether, Christian L.; Williams, Robert E.; Decker, Thomas A.; Kurtzman, Charles; Richardson, Kenneth T.; and Harrison, Richard A., 4,255,022, Cl. 351-24.000.

Williamson, Alex N.; and Tremont, Samuel J., to Monsanto Company. Dehydrocoupling of toluene. 4,255,603, Cl. 585-428.000.

Williamson, Alex N.; Tremont, Samuel J.; and Solodar, Arthur J., to Monsanto Company. Dehydrocoupling of toluene. 4,255,604, Cl. 585-428.000.

Williamson, Alex N.: *See*—
Tremont, Samuel J.; and Williamson, Alex N., 4,255,602, Cl. 585-428.000.

Willinger, Allan H.; and Itakura, Tsuyoshi. Aquarium heater. 4,255,648, Cl. 219-523.000.

Wilson, Albert C. Golf ball retriever. 4,254,981, Cl. 294-19.00A.

Wilson, Bernard, to Pratt Burnerd International Limited. Workholding. 4,254,676, Cl. 82-34.00R.

Wilson, Hugh R. Pivotal work holding device for grinding gemstones. 4,254,587, Cl. 51-229.000.

Wilson, Joseph T., III, to International Business Machines Corporation. Magnetoresistive position transducer with invariable peak signal. 4,255,708, Cl. 324-208.000.

Wilson, Richard A.; Schreiber, William L.; Mookherjee, Braja D.; Kiwala, Jacob; Vinals, Joaquin F.; Vock, Manfred H.; Stork, Gilbert; and Schmitt, Frederick L., to International Flavors & Fragrances Inc. 2,6,6-Trimethyl-α-(iso-propenyl-1-cyclohexene-1-methanol and 1,3 cyclohexadiene-1-methanol. 4,255,293, Cl. 252-522.00R.

Wilson, Robert R.; and Falconer, Roy D., to James Howden & Company Limited. Fans or the like. 4,255,080, Cl. 415-53.00R.

Wilson, Thomas G., Jr., to Bell Telephone Laboratories, Incorporated. Temperature compensated integratable RC oscillator. 4,255,721, Cl. 331-111.000.

Wingard, Robert E., Jr.; and Larson, Eric R., to Dynapol. Ethylene-vinylamine copolymers. 4,255,548, Cl. 526-310.000.

Winkelmann, Lothar: *See*—
Schnurle, Hans; Drews, Ulrich; Werner, Peter; and Winkelmann, Lothar, 4,254,742, Cl. 123-32.0EA.

Winternitz, Paul, to Hoffmann-La Roche Inc. 2-Oxo-3 thiazoline-oximes as pesticides. 4,255,436, Cl. 424-270.000.

Wisconsin Alumni Research Foundation: *See—*
Fariello, Ruggero G., 4,255,448, Cl. 424-315.000.
Wisotsky, Max J., to Exxon Research & Engineering Co. Process for the production of oil-soluble polyol esters of dicarboxylic acid materials in the presence of a metal salt of a hydroxy aromatic compound. 4,255,589, Cl. 560-198.000.
Wisotsky, Max J.: *See—*
Miller, Harold N.; Wisotsky, Max J.; and Rhodes, Richard P., 4,255,159, Cl. 44-62.000.
Witenhafer, Donald E.: *See—*
Cohen, Louis; Haehn, James B.; and Witenhafer, Donald E., 4,255,470, Cl. 427-230.000.
Withycombe, Donald A.; Mookherjee, Braja D.; Mussinan, Cynthia J.; Vock, Manfred H.; and Giacino, Christopher, to International Flavors & Fragrances Inc. 2-Alkylthioalkyl-4,5-dialkyl-Δ^3-thiazolines. 4,255,583, Cl. 548-146.000.
Wodka, Michael A.: *See—*
Propst, Robert L.; and Wodka, Michael A., 4,255,611, Cl. 174-48.000.
Woeppel, Dieter: *See—*
Schoettle, Klaus; Muenzner, Wulf; Lechner, Hilmar; Woeppel, Dieter; and Gliniorz, Lothar, 4,254,585, Cl. 51-5.00A.
Wojtalla, Peter: *See—*
Lehmann, Erhard; Wojtalla, Peter; and Voss, Peter, 4,255,675, Cl. 307-252.00A.
Wolf, Anthony D., to Du Pont de Nemours, E. I., and Company. Sulfinyl-bis carbamoyl fluorides. 4,255,353, Cl. 260-544.00C.
Wolf, Elmar; Obendorf, Johann; and Gras, Rainer, to Chemische Werke Huls AG. Coating materials and their application prepared from polyisocyanates blocked with imidazolines. 4,255,551, Cl. 528-45.000.
Wolf, Theo; Gause, Dieter; Schneider, Hans-D.; and Gunschmann, Peter, to Robert Bosch GmbH. Tape cassette. 4,254,922, Cl. 242-194.000.
Wolf, Tobin. Tortoise and hare game. 4,254,954, Cl. 273-144.00B.
Wolfe, Everett G., to Libbey-Owens-Ford Company. Support mechanism for heat exchangers in float glass apparatus. 4,255,180, Cl. 65-182.100.
Won, Se K. Dental floss holder. 4,254,786, Cl. 132-92.00A.
Wong, Ching-Ping: *See—*
Dinella, Donald; and Wong, Ching-Ping, 4,255,481, Cl. 428-209.000.
Wong, Daniel T., to Rockwell International Corporation. Safety throttle for power tools. 4,254,667, Cl. 74-526.000.
Wood, Lindley S.; Tracy, David J.; and Chakbrabarti, Paritosh M., to GAF Corporation. Sulfide polymers of polyoxyalkylenes. 4,255,561, Cl. 528-388.000.
Woodward, Robert B.; and Bickel, Hans, to Ciba-Geigy Corporation. Sulfide intermediates for the manufacture of enol derivatives. 4,255,328, Cl. 260-239.00A.
Workens, Frank M., to Falconer Plate Glass Corporation. Methods of manufacturing and protecting mirrors. 4,255,214, Cl. 148-6.14R.
World Wide Oil Tools, Inc.: *See—*
Keast, Larry G.; and Horton, Herbert D., 4,254,655, Cl. 73-49.500.
Worrell, G. Richard, to Atlantic Richfield Company. Protecting entry portions of tubes of emergency cooling system. 4,254,819, Cl. 165-1.000.
Wright, Charles P.; and Thornock, Russel L., to Boeing Company, The. Jet engine multiduct noise suppressor. 4,254,620, Cl. 60-263.000.
Wright, Hal E.: *See—*
Van Allan, James A.; Rossi, Louis J.; Bloom, Melvin S.; Regan, Michael T.; Wright, Hal E.; and Kaukeinen, Joseph Y., 4,255,506, Cl. 430-41.000.
Wright, John C., to Wright, John C. Disposal of liquid waste and recovery of metals therefrom. 4,255,067, Cl. 405-129.000.
Wright, John D.; and Simpson, Peter D., to Rustic Crafts. Assembleable mantelpiece. 4,254,596, Cl. 52-36.000.
Wright, William W.: *See—*
Watts, Roger E.; Wright, William W.; and Donarski, William J., 4,255,626, Cl. 200-6.00A.
Wu, Ching-Yong; Kobylinski, Thaddeus P.; and Bozik, John E., to Gulf Research & Development Company. Preparation of ethylene glycol from ethylene. 4,255,596, Cl. 568-860.000.
Wu, Ching-Yong; Kobylinski, Thaddeus P.; and Bozik, John E., to Gulf Research & Development Company. Preparation of styrene from ethylbenzene. 4,255,599, Cl. 585-319.000.
Wunderlich, Klaus: *See—*
Harms, Wolfgang; Wunderlich, Klaus; and van Oertzen, Klaus, 4,255,325, Cl. 260-146.00T.
Wurlitzer Company, The: *See—*
Machanian, William V.; and Hoskinson, William R., 4,254,682, Cl. 84-1.010.
Wurzig, Lars R.: *See—*
Alpkvist, Jan A.; Tornkvist, Rolf G. A.; and Wurzig, Lars R., 4,255,122, Cl. 431-215.000.
Wuskell, Joseph P., to Quaker Oats Company, The. Process for preparing phenol-formaldehyde-furfuryl alcohol terpolymers. 4,255,554, Cl. 528-129.000.
Wyoming Mineral Corp.: *See—*
Chiang, Peter T., 4,255,392, Cl. 423-11.000.
Wyse, Harold G.: *See—*
Kelley, John R.; and Wyse, Harold G., 4,255,736, Cl. 337-407.000.
Xerox Corporation: *See—*
Corona, Stephen C., 4,255,046, Cl. 355-68.000.
Crean, Peter A.; and Spencer, Paul R., 4,255,754, Cl. 346-75.000.
Frey, Thomas M., 4,255,767, Cl. 358-301.000.
Morris, Lyle E.; and Sun, Kai C. K., 4,255,694, Cl. 318-565.000.
Moser, Rabin, 4,254,732, Cl. 118-60.000.
Scifres, Donald R.; Streifer, William; and Burnham, Robert D., 4,255,717, Cl. 331-94.50H.
Wang, Shing C.; and Hamerdinger, Randolph W., 4,255,720, Cl. 331-94.50G.
Weigl, John W.; Reilich, William M.; and Mailloux, Louis D., 4,255,040, Cl. 355-3.00R.
Yamaguchi, Denjirou; Mogi, Noboru; Seta, Toshio; Oishi, Kunizo; Fuzimori, Yoshihisa; and Suzuki, Atsushi, to Toyo Ink Manufacturing Co., Ltd. Thermogenic compositions. 4,255,157, Cl. 44-3.00C.
Yamamoto, Masahiro: *See—*
Miyata, Seiji; Akagawa, Masatake; Yamamoto, Masahiro; and Inoue, Noboru, 4,254,779, Cl. 128-731.000.
Yau, Ben J., to Owens-Corning Fiberglas Corporation. Binder for glass fiber mat. 4,255,485, Cl. 428-288.000.
Yee, Kwok-Chun: *See—*
Baughman, Ray H.; Turi, Edith A.; Preziosi, Anthony F.; and Yee, Kwok-Chun, 4,255,535, Cl. 525-129.000.
Yielding, Ralph D., to Offshore Company, The. Jack-up platform locking apparatus. 4,255,069, Cl. 405-196.000.
Yoneda, Haruyuki: *See—*
Sakurai, Hisaya; Morita, Hideo; Miya, Masayoshi; Takaya, Katsuhiko; and Yoneda, Haruyuki, 4,255,280, Cl. 252-429.00B.
Yoo, Jin S.: *See—*
Sun, Jui-Yuan; Burk, Emmett H., Jr.; Yoo, Jin S.; and Masolgites, George P., 4,255,156, Cl. 44-1.0SR.
Yoon, Inbae. Safety endoscope system. 4,254,762, Cl. 128-4.000.
Yoshida, Hiroshi; and Akashi, Shunji, to Yoshida Kogyo K K. Slide fastener stringer. 4,254,539, Cl. 24-205.11F.
Yoshida, Kazuhiro: *See—*
Takeyasu, Kiyoo; Kato, Kanji; Goto, Tatsuo; Oouchi, Yoozoo; Yoshida, Kazuhiro; Ito, Yoshitoshi; and Takami, Katsumi, 4,255,762, Cl. 358-100.000.
Yoshida, Kazumasa, to Toshiba Ray-O-Vac Co., Ltd. Button-type air cell. 4,255,498, Cl. 429-27.000.
Yoshida Kogyo K K: *See—*
Tsubata, Noritaka, 4,254,803, Cl. 139-384.00B.
Yoshida, Hiroshi; and Akashi, Shunji, 4,254,539, Cl. 24-205.11F.
Yoshida, Shigeru: *See—*
Wada, Yoshinobu; and Yoshida, Shigeru, 4,254,804, Cl. 141-40.000.
Yoshida, Takashi: *See—*
Nonaka, Terumoto; Yoshida, Takashi; and Matsuyama, Takeshi, 4,255,671, Cl. 307-446.000.
Yoshida, Yasuharu, to Nippon Electric Co., Ltd. Carrier regeneration circuit for polyphase modulation system. 4,255,713, Cl. 329-50.000.
Yoshida, Yoshinobu: *See—*
Ono, Shigetoshi; Harada, Tooru; Fujita, Shinsaku; and Yoshida, Yoshinobu, 4,255,509, Cl. 430-216.000.
Yoshino Kogyosho Co., Ltd.: *See—*
Yoshino, Yataro, 4,254,882, Cl. 215-1.00C.
Yoshino, Yataro, to Yoshino Kogyosho Co., Ltd. Plastic pressure bottle. 4,254,882, Cl. 215-1.00C.
Yoshizaki, Hiroyuki: *See—*
Megumi, Takeaki; Yoshizaki, Hiroyuki; and Kondoh, Sigeo, 4,255,557, Cl. 528-196.000.
Young, Gary W. Surfboard and method and apparatus for making surfboards and like molded structures. 4,255,221, Cl. 156-382.000.
Young, John: *See—*
Jones, Gordon H.; and Young, John, 4,255,405, Cl. 424-311.000.
Young, L. Brewster, to Mobil Oil Corporation. ZSM-12 Cycloolefin dimerization. 4,255,600, Cl. 585-362.000.
Yu, Kin C.: *See—*
Holtey, Thomas O.; and Yu, Kin C., 4,255,786, Cl. 364-200.000.
Yuichi, Tamura: *See—*
Akio, Ohno; and Yuichi, Tamura, 4,254,634, Cl. 62-217.000.
Yuki, Kiyohiro: *See—*
Matsuda, Hideo; Yuki, Kiyohiro; Kawade, Takashi; Adachi, Takaaki; and Hanabe, Kenichi, 4,255,766, Cl. 358-257.000.
Yukio, Katahira, to Osawa Precision Industries, Ltd. Zoom lens system capable of macrophotography. 4,255,020, Cl. 350-430.000.
Yukuta, Toshio; Fukuda, Hiroya; and Ishii, Seiji, to Bridgestone Tire Company Limited. Method of producing a moisture- and heat-resistant flexible polyurethane foam. 4,255,526, Cl. 521-108.000.
Zahnradfabrik Friedrichshafen Aktiengesellschaft: *See—*
Schulz, Horst, 4,254,669, Cl. 74-705.000.
Zaidan Hojin Biseibutsu Kagaku Kenkyu Kai: *See—*
Umezawa, Sumio; Umezawa, Hamao; and Tatsuta, Kuniaki, 4,255,564, Cl. 536-17.00R.
Zajac, John, to Eaton Corporation. Plasma etching process. 4,255,230, Cl. 156-643.000.
Zaltieri, Adriano; and Coli, Giuseppe, to Ing. C. Olivetti & C., S.p.A. Electromagnetic line spacing device. 4,255,063, Cl. 400-568.000.
Zatsepin, Nikolai N.; Siljuk, Viktor F.; Malko, Ivan I.; Kaloshin, Valentin A.; Aniskovich, Valery M.; Naumenko, Nikolai N.; and Perfiliev, Vladimir V. Device for providing an electrical signal proportional to the thickness of a measured coating with an automatic range switch and sensitivity control. 4,255,709, Cl. 324-229.000.
Zawick, George. Tape guiding accessory for sewing machines. 4,254,719, Cl. 112-130.000.
Zebuhr, William H., to Sunhouse Incorporated. Heat transfer system. 4,254,636, Cl. 62-325.000.
Zeitzoff, Peter M.; Lee, Teh-Hsuang; Burkey, Bruce C.; Khosla, Rajinder P.; and Kelly, Thomas M., to Eastman Kodak Company. Multiple, superposed-channel color image sensor. 4,255,760, Cl. 358-41.000.

Zenatti, Daniel: *See*—
Bernard, Paul; and Zenatti, Daniel, 4,255,465, Cl. 427-62.000.
Zenda, Richard J.: *See*—
Malacheski, Joseph J.; and Zenda, Richard J., 4,254,537, Cl. 24-71.300.
Zenith Carburetter Company Limited, The: *See*—
Ross, Gray E. D., 4,255,362, Cl. 261-34.00B.
Zerna, Wolfgang; Krabbe, Wilfried; and Schafer, Hans, to Philipp Holzmann AG. Process of producing a cooling tower. 4,255,366, Cl. 264-35.000.
Zhilin, Viktor F.: *See*—
Kalinin, Viktor P.; Avdjukhin, Sergei P.; Lebedev, Vsevolod I.; Zhilin, Viktor F.; Frolov, Vladimir S.; Anisimov, Jury V.; Slavin, Jury T.; and Larionov, Valentin N., 4,255,373, Cl. 264-65.000.
Zic, Richard: *See*—
Michaels, Leonard H.; Thompson, Garry W.; and Zic, Richard, 4,255,007, Cl. 339-88.00R.
Zinsmeyer, Thomas M.; and Leonard, Gary S., to Carrier Corporation. Method and apparatus for satisfying heating and cooling demands and control therefor. 4,254,632, Cl. 62-117.000.
Zirner, Joachim: *See*—
Muller, Hans-Jurgen; Hombach, Rudolf; Dollhausen, Manfred; and Zirner, Joachim, 4,255,569, Cl. 544-193.000.
Zschauer, Karl-Heinz: *See*—
Endler, Wolfgang; and Zschauer, Karl-Heinz, 4,255,206, Cl. 148-171.000.
Zurbuchen, Jacques; and Dussy, Paul, to Ciba-Geigy Corporation. Process for the level dyeing of polyester material. 4,255,154, Cl. 8-638.000.
Zwick, Eugene B. Prevaporizing burner and method. 4,255,116, Cl. 431-11.000.
Zwipf, Werner H.: *See*—
Bishilany, William J., III; Buehl, Arnold L.; and Zwipf, Werner H., 4,255,123, Cl. 431-328.000.
Zwissler, Ruedi. Mounting for detachably connecting wall panels and the like. 4,254,600, Cl. 52-281.000.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 10TH DAY OF MARCH, 1981

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Eaton Corporation: *See*—
Piber, Earl T., Re. 30,546, Cl. 200-308.000.

Halcon Research and Development Corporation: *See*—
Khoobiar, Sargis, Re. 30,545, Cl. 252-455.00R.

Halm Instrument Co., Inc.: *See*—
Lyon, Floyd A.; and Harrison, Henry, deceased, Re. 30,540, Cl. 126-421.000.

Harrison, Dorothy D., administratrix: *See*—
Lyon, Floyd A.; and Harrison, Henry, deceased, Re. 30,540, Cl. 126-421.000.

Harrison, Henry, deceased: *See*—
Lyon, Floyd A.; and Harrison, Henry, deceased, Re. 30,540, Cl. 126-421.000.

Hitzman, Donald O.; and Wegner, Eugene H., to Provesta Corporation. Methanol foam fermentation to single cell protein by *Pseudomonas methanica*. Re. 30,543, Cl. 435-246.000.

Khoobiar, Sargis, to Halcon Research and Development Corporation. Catalyst. Re. 30,545, Cl. 252-455.00R.

Larson, Lester M. Thermoplastic splint or cast. Re. 30,541, Cl. 128-90.000.

Lyon, Floyd A.; and Harrison, Henry, deceased (by Harrison, Dorothy D., administratrix), to Halm Instrument Co., Inc. Heat storage water tank. Re. 30,540, Cl. 126-421.000.

Piber, Earl T., to Eaton Corporation. Function indication means for electric switches. Re. 30,546, Cl. 200-308.000.

Provesta Corporation: *See*—
Hitzman, Donald O.; and Wegner, Eugene H., Re. 30,543, Cl. 435-246.000.

van der Lely, Cornelis. Soil cultivating implements. Re. 30,539, Cl. 111-6.000.

Wegner, Eugene H.: *See*—
Hitzman, Donald O.; and Wegner, Eugene H., Re. 30,543, Cl. 435-246.000.

LIST OF DESIGN PATENTEES

Acosta, Armando E., to Bernyk, George S. Player sequence indicator sign. 258,514, 3-10-81, Cl. D20-42.000.

Adam, John M., to NCH Corporation. Urinal screen. 258,472, 3-10-81, Cl. D6-86.000.

Ashton, Harold P., to Dart Industries Inc. Card rack or the like. 258,511, 3-10-81, Cl. D19-90.000.

Atkinson, Donald A. Flat plate solar collector. 258,530, 3-10-81, Cl. D23-72.000.

Automatic Liquid Packaging, Inc.: *See*—
Nagel, Dieter H., 258,534, Cl. D24-56.000.
Pagels, Louis T., 258,533, Cl. D24-56.000.

Bartley, Richard H.: *See*—
Brugger, Robert E.; Bartley, Richard H.; Waldron, Ernest J., Jr.; and Piontkowski, Carl F., 258,487, Cl. D7-210.000.

Benedetto, Amedeo P. Star emblem. 258,544, 3-10-81, Cl. D99-27.000.

Benedict, Stuart E., to Union Carbide Corporation. Packaging container with cap. 258,495, 3-10-81, Cl. D9-388.000.

Bernyk, George S.: *See*—
Acosta, Armando E., 258,514, Cl. D20-42.000.

Berzack, Harry L. Transport roller for label printer or the like. 258,510, 3-10-81, Cl. D18-22.000.

Bosch Siemens Hausgerate GmbH: *See*—
Reichl, Ernst, 258,535, Cl. D24-62.000.

Brazil, Dennis H.; and Sears, John J. Bulk health food vending dispenser. 258,513, 3-10-81, Cl. D20-4.000.

Brown, Larry L.; and Hamm, Robert G. Mine roof warning indicator. 258,499, 3-10-81, Cl. D10-104.000.

Brugger, Robert E.; Bartley, Richard H.; Waldron, Ernest J., Jr.; and Piontkowski, Carl F., to C & D Distributors, Inc. Tool for gripping and lifting logs. 258,487, 3-10-81, Cl. D7-210.000.

C & D Distributors, Inc.: *See*—
Brugger, Robert E.; Bartley, Richard H.; Waldron, Ernest J., Jr.; and Piontkowski, Carl F., 258,487, Cl. D7-210.000.

Capitol Products Corporation: *See*—
Cribben, James T.; and Feeser, Richard A., 258,537, Cl. D25-74.000.
Cribben, James T.; and Feeser, Richard A., 258,538, Cl. D25-74.000.

Chevassus, Alain, to Lefebure Isolants Reunis. Cosmetic box. 258,542, 3-10-81, Cl. D28-83.000.

Chromcraft Corporation: *See*—
Pittman, Ernest A., 258,477, Cl. D6-144.000.

Chun, Ngo C. Container for cosmetics or the like. 258,470, 3-10-81, Cl. D3-39.000.

Cribben, James T.; and Feeser, Richard A., to Capitol Products Corporation. Swimming pool coping member or similar article. 258,537, 3-10-81, Cl. D25-74.000.

Cribben, James T.; and Feeser, Richard A., to Capitol Products Corporation. Swimming pool coping member or similar article. 258,538, 3-10-81, Cl. D25-74.000.

Darnell, Eric. Heating stove. 258,529, 3-10-81, Cl. D23-97.000.

Dart Industries Inc.: *See*—
Ashton, Harold P., 258,511, Cl. D19-90.000.

Dietrich, Gerhard, to Grundig Aktiengesellschaft. Telephone answering device-adapter. 258,507, 3-10-81, Cl. D14-66.000.

Drackett Company, The: *See*—
Ludwig, Clifford J., Jr.; and Gerk, Walter J., 258,496, Cl. D9-439.000.

Edson, Sydney, to Textron, Inc. Rotatable display rack. 258,473, 3-10-81, Cl. D6-85.000.

Edstrom, Richard. Combined mirror and razor and shaving cream holder. 258,474, 3-10-81, Cl. D6-88.000.

Edstrom, Richard. Combined mirror and holder for razors. 258,475, 3-10-81, Cl. D6-88.000.

Eller, Chauncey B. Anti-spill beverage device. 258,485, 3-10-81, Cl. D7-47.000.

Ethyl Corporation: *See*—
Hayes, Thomas H., 258,491, Cl. D9-378.000.

Featherstone, Ivy. Double hair pick. 258,541, 3-10-81, Cl. D28-31.000.

Feeser, Richard A.: *See*—
Cribben, James T.; and Feeser, Richard A., 258,537, Cl. D25-74.000.
Cribben, James T.; and Feeser, Richard A., 258,538, Cl. D25-74.000.

Fenton, Robert N. Combined meter and electrical housing. 258,505, 3-10-81, Cl. D13-40.000.

Foster Industries Co., Ltd.: *See*—
Leung, Chung S., 258,539, Cl. D26-46.000.

Friedrich Grohe Armaturenfabrik GmbH & Co.: *See*—
Thevenot, Gilles, 258,518, Cl. D23-23.000.
Thevenot, Gilles, 258,519, Cl. D23-25.000.
Thevenot, Gilles, 258,520, Cl. D23-26.000.
Thevenot, Gilles, 258,521, Cl. D23-25.000.
Thevenot, Gilles, 258,522, Cl. D23-25.000.
Thevenot, Gilles, 258,523, Cl. D23-25.000.
Thevenot, Gilles, 258,524, Cl. D23-28.000.
Thevenot, Gilles, 258,525, Cl. D23-28.000.

Funabashi, Genichi, to Kubota, Ltd. Tractor. 258,509, 3-10-81, Cl. D15-23.000.

General Motors Corporation: *See*—
Schinella, John R., 258,504, Cl. D12-211.000.
Semple, Thomas H., 258,503, Cl. D12-211.000.

Gerk, Walter J.: *See*—
Ludwig, Clifford J., Jr.; and Gerk, Walter J., 258,496, Cl. D9-439.000.

Gilboy, Nancy J.; Helmstadter, Katherine J.; and Walsh, John J. Adjustable wall rack for holding hair treating devices. 258,476, 3-10-81, Cl. D6-125.000.

Gipson, Donald G. Combined bracket and locking support hook unit for holding truck tire chains while not in use. 258,489, 3-10-81, Cl D8-333.000.

Gosselin, Robert G.: *See*—
Wallace, Edward M.; Gosselin, Robert G.; and Labarre, Ernest D., 258,486, Cl. D7-132.000.

Green, Raymond M., Jr.: *See*—
Souhan, Mary; and Green, Raymond M., Jr., 258,527, Cl. D23-77.000.

Grundig Aktiengesellschaft: *See*—
Dietrich, Gerhard, 258,507, Cl. D14-66.000.
Hamm, Robert G.: *See*—
Brown, Larry L.; and Hamm, Robert G., 258,499, Cl. D10-104.000.
Hartmann, Norbert, to Pharmaton S.A. A bottle. 258,497, 3-10-81, Cl. D9-377.000.
Hartmann, Norbert, to Pharmator S.A. Bottle. 258,498, 3-10-81, Cl. D9-399.000.
Hayes, Thomas H., to Ethyl Corporation. Bottle or similar article. 258,491, 3-10-81, Cl. D9-378.000.
Helmstadter, Katherine J.: *See*—
Gilboy, Nancy J.; Helmstadter, Katherine J.; and Walsh, John J., 258,476, Cl. D6-125.000.
Juziuk, Peter M., to Kent-Moore Corporation. Urethane pull knife and blade. 258,488, 3-10-81, Cl. D8-98.000.
Kay, David. Wooden panel for tiles, building panels, furniture and the like. 258,536, 3-10-81, Cl. D25-92.000.
Kent-Moore Corporation: *See*—
Juziuk, Peter M., 258,488, Cl. D8-98.000.
Kloefkorn, Earl W., deceased; and by Kloefkorn, Melvin L., heir. Conveyor slat member or similar article. 258,500, 3-10-81, Cl. D12-60.000.
Kloefkorn, Melvin L., heir: *See*—
Kloefkorn, Earl W., deceased; and Kloefkorn, Melvin L., heir, 258,500, Cl. D12-60.000.
Kotuby, Paul M.; and Reed, Joseph F., to Risdon Corporation. Cigarette treatment device and similar article. 258,540, 3-10-81, Cl. D27-51.000.
Kroll, Frederick H. Chiropractic mattress, or similar article. 258,481. 3-10-81, Cl. D6-201.000.
Kubota, Ltd.: *See*—
Funabashi, Genichi, 258,509, Cl. D15-23.000.
Labarre, Ernest D.: *See*—
Wallace, Edward M.; Gosselin, Robert G.; and Labarre, Ernest D., 258,486, Cl. D7-132.000.
Lefebure Isolants Reunis: *See*—
Chevassus, Alain, 258,542, Cl. D28-83.000.
Leung, Chung S., to Foster Industries Co., Ltd. Inspection lamp for automobiles. 258,539, 3-10-81, Cl. D26-46.000.
Ludwig, Clifford J., Jr.; and Gerk, Walter J., to Drackett Company The. Container closure. 258,496, 3-10-81, Cl. D9-439.000.
Metaframe Corporation: *See*—
Molnar, John A., 258,543, Cl. D30-1.000.
Miller, Lawrence I.: *See*—
Weinstein, Hugo O., 258,483, Cl. D7-6.000.
Mills, Henry A. Portable desk. 258,479, 3-10-81, Cl. D6-184.000.
Molnar, John A., to Metaframe Corporation. Small animal habitat module or similar article. 258,543, 3-10-81, Cl. D30-1.000.
Nagel, Dieter H., to Automatic Liquid Packaging, Inc. Tapered vial or the like. 258,534, 3-10-81, Cl. D24-56.000.
NCH Corporation: *See*—
Adam, John M., 258,472, Cl. D6-86.000.
Nederman, Bill P. P. Connection fitting for tubular conduits. 258,526, 3-10-81, Cl. D23-43.000.
Nespor, Ronald R. Push bumper for tow trucks. 258,502, 3-10-81, Cl. D12-170.000.
Noose, Theodore. Combined charcoal igniter and handle therefor. 258,528, 3-10-81, Cl. D23-90.100.
Orsing Incorporated: *See*—
Orsing, John H., 258,531, Cl. D24-10.000.
Orsing, John H., to Orsing Incorporated. Saliva ejector. 258,531, 3-10-81, Cl. D24-10.000.
O'Toole, Jerome M.; and Paquette, Edmund T., to Wright Line Inc. Desk support for a document holder. 258,512, 3-10-81, Cl. D19-100.000.
Owens-Illinois, Inc.: *See*—
Plummer, James E., 258,492, Cl. D9-376.000.
Plummer, James E., 258,493, Cl. D9-385.000.
Pagels, Louis T., to Automatic Liquid Packaging, Inc. Culture vial or the like. 258,533, 3-10-81, Cl. D24-56.000.
Paquette, Edmund T.: *See*—
O'Toole, Jerome M.; and Paquette, Edmund T., 258,512, Cl. D19-100.000.
Pharmaton S.A.: *See*—
Hartmann, Norbert, 258,497, Cl. D9-377.000.
Pharmator S.A.: *See*—
Hartmann, Norbert, 258,498, Cl. D9-399.000.
Piontkowski, Carl F.: *See*—
Brugger, Robert E.; Bartley, Richard H.; Waldron, Ernest J., Jr.; and Piontkowski, Carl F., 258,487, Cl. D7-210.000.
Pittman, Ernest A., to Chromcraft Corporation. Bar. 258,477, 3-10-81, Cl. D6-144.000.
Plummer, James E., to Owens-Illinois, Inc. Decanter. 258,492, 3-10-81, Cl. D9-376.000.
Plummer, James E., to Owens-Illinois, Inc. Bottle. 258,493, 3-10-81, Cl. D9-385.000.
Reed, Joseph F.: *See*—
Kotuby, Paul M.; and Reed, Joseph F., 258,540, Cl. D27-51.000.
Reichl, Ernst, to Bosch Siemens Hausgerate GmbH. Ultrasonic nebulizer. 258,535, 3-10-81, Cl. D24-62.000.
Richardson-Merrell Inc.: *See*—
Seidenberger, James W., 258,517, Cl. D22-19.000.
Risdon Corporation: *See*—
Kotuby, Paul M.; and Reed, Joseph F., 258,540, Cl. D27-51.000.
Romagnoli, G. Franco. Container for liquids. 258,494, 3-10-81, Cl. D9-375.000.
Rowland, David L. Combined seat and backrest unit for a chair 258,480, 3-10-81, Cl. D6-200.000.
Rutt, Rebecca. Doll. 258,515, 3-10-81, Cl. D21-166.000.
Samsonite Corporation: *See*—
Workman, David E., 258,471, Cl. D3-71.000.
Schinella, John R., to General Motors Corporation. Vehicle wheel. 258,504, 3-10-81, Cl. D12-211.000.
Sears, John J.: *See*—
Brazil, Dennis H.; and Sears, John J., 258,513, Cl. D20-4.000.
Seidenberger, James W., to Richardson-Merrell Inc. Insect trap cross-member support. 258,517, 3-10-81, Cl. D22-19.000.
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Serrambana, Victor M. Pump impeller housing. 258,508, 3-10-81, Cl. D15-1.000.
Slepicka, Frank V. Drinking mug. 258,484, 3-10-81, Cl. D7-9.000.
Slingerland, Michael R. Swallow tail surfboard. 258,516, 3-10-81, Cl. D21-236.000.
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Strock, Gina. Seating cushion. 258,482, 3-10-81, Cl. D6-204.000.
Stumler, Joseph W. Container for liquids. 258,490, 3-10-81, Cl. D9-370.000.
Textron, Inc.: *See*—
Edson, Sydney, 258,473, Cl. D6-85.000.
Thevenot, Gilles, to Friedrich Grohe Armaturenfabrik GmbH & Co. Lavatory faucet. 258,518, 3-10-81, Cl. D23-23.000.
Thevenot, Gilles, to Friedrich Grohe Armaturenfabrik GmbH & Co Kitchen sink faucet. 258,519, 3-10-81, Cl. D23-25.000.
Thevenot, Gilles, to Friedrich Grohe Armaturenfabrik GmbH & Co. Combined bath and shower fixture unit. 258,520, 3-10-81, Cl. D23-26.000.
Thevenot, Gilles, to Friedrich Grohe Armaturenfabrik GmbH & Co. Lavatory faucet. 258,521, 3-10-81, Cl. D23-25.000.
Thevenot, Gilles, to Friedrich Grohe Armaturenfabrik GmbH & Co. Lavatory fixture unit. 258,522, 3-10-81, Cl. D23-25.000.
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Thomas, Wesley L. Telephone. 258,506, 3-10-81, Cl. D14-53.000.
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Benedict, Stuart E., 258,495, Cl. D9-388.000.
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Waldron, Ernest J., Jr.: *See*—
Brugger, Robert E.; Bartley, Richard H.; Waldron, Ernest J., Jr.; and Piontkowski, Carl F., 258,487, Cl. D7-210.000.
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Wallace, Edward M.; Gosselin, Robert G.; and Labarre, Ernest D., 258,486, Cl. D7-132.000.
Walsh, John J.: *See*—
Gilboy, Nancy J.; Helmstadter, Katherine J.; and Walsh, John J., 258,476, Cl. D6-125.000.
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Winslow, Norris C. Reversible fuel tank. 258,501, 3-10-81, Cl. D12-155.000.
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Christensen, Jack E., 4,664, Cl. 8.000.
Swim, Herbert C.; and Christensen, Jack E., 4,666, Cl. 24.000.
Christensen, Jack E., to Armstrong Nurseries, Inc. Rose plant. 4,663, 3-10-81, Cl. 7.000.
Christensen, Jack E., to Armstrong Nurseries, Inc. Rose plant. 4,664, 3-10-81, Cl. 8.000.
Christensen, Jack E.: *See*—
Swim, Herbert C.; and Christensen, Jack E., 4,666, Cl. 24.000.
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De Vor, Paul F., deceased, 4,665, Cl. 11.000.
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De Vor, Thelma G., executor: *See*—
De Vor, Paul F., deceased, 4,665, Cl. 11.000.
Duffett, William E.: *See*—
Jessel, Walter H., Jr.; and Duffett, William E., 4,667, Cl. 70.000.
Jessel, Walter H., Jr.; and Duffett, William E., 4,668, Cl. 71.000.
Jessel, Walter H., Jr.; and Duffett, William E., to Yoder Brothers, Inc. Carnation plant. 4,667, 3-10-81, Cl. 70.000.
Jessel, Walter H., Jr.; and Duffett, William E., to Yoder Brothers, Inc. Carnation plant. 4,668, 3-10-81, Cl. 71.000.
Swim, Herbert C.; and Christensen, Jack E., to Armstrong Nurseries, Inc. Rose plant. 4,666, 3-10-81, Cl. 24.000.
Yoder Brothers, Inc.: *See*—
Jessel, Walter H., Jr.; and Duffett, William E., 4,667, Cl. 70.000.
Jessel, Walter H., Jr.; and Duffett, William E., 4,668, Cl. 71.000.

CLASSIFICATION OF PATENTS

ISSUED MARCH 10, 1981

NOTE.—First number, class; second number, subclass; third number, patent number

CLASS 2

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CLASS 3

1.5 4,254,508
13 4,254,509
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CLASS 4

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449 4,254,515
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348 4,254,773
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653 4,254,778
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48 S 4,254,822
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143 4,254,826
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159.15 4,255,243
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257 4,255,245
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316 4,254,865
320 4,254,866
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524 4,254,870
534 4,254,871
561 4,254,872
599 4,254,873

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64 4,255,250
108 4,255,251
182 4,255,252
216 PP 4,255,253

CLASS 209

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547 4,254,875
577 4,254,876
594 4,254,877
682 4,254,878

CLASS 210

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173 4,255,327
239 A 4,255,328
239 D 4,255,329
239.1 4,255,330
239.55 R 4,255,331
245.3 4,255,332
319.1 4,255,333
326.47 4,255,335
326.5 B 4,255,334
345.2 4,255,336
346.11 4,255,337
4,255,338
346.22 4,255,339
346.74 4,255,340
348.34 4,255,341
383 4,255,342
385 4,255,343
397.1 4,255,344
4,255,345
429 R 4,255,347
449.6 R 4,255,349
453 P 4,255,350
456 R 4,255,351
465.8 R 4,255,352
544 C 4,255,353

CLASS 261

5 4,255,360
27 4,255,361
34 B 4,255,362
114 TC 4,255,363

CLASS 264

1.9 4,255,364
22 4,255,365
35 4,255,366
45.1 4,255,367
45.5 4,255,368
46.6 4,255,369
51 4,255,370
54 4,255,371
4,255,372
65 4,255,373
111 4,255,374
117 4,255,375
145 4,255,376
176 F 4,255,377
322 4,255,378
328.17 4,255,379
505 4,255,380
519 4,255,381
544 4,255,382

CLASS 266

51 4,254,942
149 4,254,943
275 4,254,944

CLASS 269

102 4,254,945
152 4,254,946

CLASS 270

39 4,254,947
359 4,254,891

CLASS 272

70.3 4,254,948
130 4,254,949
4,254,950

CLASS 273

1 F 4,254,951
26 A 4,254,952
54 B 4,254,953
144 B 4,254,954
148 R 4,254,955
186 R 4,254,956
271 4,254,957
421 4,254,958

CLASS 277

12 4,254,960
80 4,254,961
181 4,254,962
235 R 4,254,963

CLASS 280

20 4,254,964
203 4,254,965
405 R 4,254,966
433 4,254,967
477 4,254,968
478 B 4,254,969
705 4,254,970

CLASS 282

27.5 4,254,971

CLASS 285

61 4,254,972
312 4,254,973

CLASS 292

259 4,254,974
264 4,254,975
292 4,254,976
320 4,254,977

CLASS 293

137 4,254,978

CLASS 294

1 BA 4,254,979
15 4,254,980
19 A 4,254,981
81 R 4,254,982
86.21 4,254,983
88 4,254,984

CLASS 295

7 4,254,985

CLASS 296

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190 4,254,988
210 4,254,986
216 4,254,989

CLASS 297

273 4,254,990
345 4,254,991
440 4,254,992

CLASS 299

10 4,254,993
12 4,254,994
17 4,254,995

CLASS 303

6 C 4,254,996
4,254,997
20 4,254,998

CLASS 307

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131 4,255,669
221 D 4,255,673
252 A 4,255,675
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304 4,255,677
355 4,255,678
4,255,679
446 4,255,671
455 4,255,672
473 4,255,670

CLASS 308

3 A 4,254,999
8.2 4,255,000

CLASS 310

13 4,255,680
162 4,255,681
168 4,255,682
214 4,255,683
216 4,255,684

CLASS 312

114 4,255,001
348 4,255,002

CLASS 313

330 4,255,685
366 4,255,686
488 4,255,687
499 4,255,688

CLASS 315

3 4,255,689
106 4,255,690
241 P 4,255,691
324 4,255,692

CLASS 318

565 4,255,694
685 4,255,693
696 4,255,696
723 4,255,695

CLASS 320

6 4,255,697
35 4,255,698

CLASS 323

210 4,255,700
217 4,255,701
322 4,255,699

CLASS 324

58 B 4,255,702
71 CP 4,255,703
127 4,255,704
4,255,705
132 4,255,706
142 4,255,707
208 4,255,708
229 4,255,709
328 4,255,710
329 4,255,711

CLASS 328

162 4,255,712

CLASS 329

50 4,255,713
103 4,255,714

CLASS 330

9 4,255,715
284 4,255,716

CLASS 331

94.5 F 4,255,719
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94.5 H 4,255,717
94.5 L 4,255,718
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113 R 4,255,722
116 FE 4,255,723

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17 L 4,255,724
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195 4,255,726
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202 4,255,729
219 4,255,728
247 4,255,730
258 4,255,731

CLASS 335

16 4,255,732
190 4,255,733

CLASS 336

147 4,255,734
192 4,255,735

CLASS 337

407 4,255,736

CLASS 339

17 C 4,255,005
17 E 4,255,004
17 LM 4,255,003
58 4,255,006
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89 M 4,255,008
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177 R 4,255,011
242 4,255,012

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46 4,255,738
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347 DD 4,255,742
347 SY 4,255,743
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546 4,255,745
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CLASS 353

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320 4,255,039

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100 4,255,762
135 4,255,763
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10 4,255,768
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69 4,255,770
77 4,255,771
113 4,255,772

CLASS 361

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95 4,255,774
153 4,255,775
213 4,255,776
228 4,255,777
236 4,255,778
308 4,255,779

CLASS 362

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374 4,255,781

CLASS 363

8 4,255,782
96 4,255,783
129 4,255,784

CLASS 364

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728 4,255,795
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CLASS 365

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CLASS 366

25 4,255,058
97 4,255,059
137 4,255,060

CLASS 367

1 4,255,797
35 4,255,798
96 4,255,799
99 4,255,800

CLASS 368

1 D 4,255,801
69 4,255,802
72 4,255,803
84 4,255,804
108 4,255,805
240 4,255,806

CLASS 369

41 4,254,959

CLASS 371

21 4,255,807
38 4,255,808
58 4,255,809

CLASS 375

1 4,255,810
2 4,255,811
4 4,255,812
34 4,255,813

CLASS 400

124 4,255,061
4,255,062
568 4,255,063
708 4,255,064

CLASS 402

75 4,255,065

CLASS 405

76 4,255,066
129 4,255,067
195 4,255,068
196 4,255,069
260 4,255,070
290 4,255,071

CLASS 406

89 4,255,072

CLASS 411

167 4,254,809

CLASS 414

32 4,255,073
62 4,255,074
222 4,255,075
729 4,255,076
786 4,255,077

CLASS 415

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11 4,255,079
53 R 4,255,080
90 4,255,081
119 4,255,083
182 4,255,082

CLASS 416

145 4,255,084
197 A 4,255,085
218 4,255,086
230 4,255,087

CLASS 417

1 4,255,088
2 4,255,089
53 4,255,090
63 4,255,091
222 4,255,092
310 4,255,093
311 4,255,094
406 4,255,095
415 4,255,096
462 4,255,097

CLASS 418

76 4,255,098
97 4,255,099
184 4,255,100

CLASS 422

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57 4,255,384
61 4,255,385
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209 4,255,389
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259 4,255,391

CLASS 423

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258 4,255,404
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659 4,255,410

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50 4,255,414
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251 4,255,427
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320 4,255,450
337 4,255,451
359 4,255,452

CLASS 425

68 4,255,101
74 4,255,102
78 4,255,103
111 4,255,104
144 4,255,105
152 4,255,106
163 4,255,107
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CLASS 426

36 4,255,454
42 4,255,455
64 4,255,456
407 4,255,457
424 4,255,458
521 4,255,459
538 4,255,460
595 4,255,461

CLASS 427

27 4,255,462
51 4,255,463
54.1 4,255,464
62 4,255,465
113 4,255,466
137 4,255,468
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385.5 4,255,471
445 4,255,472
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CLASS 428

44 4,255,475
46 4,255,474
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106 4,255,477
113 4,255,478
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CLASS 430

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216 4,255,509
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2 4,255,114
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6 4,255,138
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CLASS 434

267 4,254,562

CLASS 435

18 4,255,517
161 4,255,518
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51 4,255,814
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251 4,255,146
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60 4,254,693
179 4,254,692

CLASS 521

27 4,255,523
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201 4,255,545
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310 4,255,548

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28 4,255,549
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17 R 4,255,564
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CLASS 560

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CLASS 562

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517 4,255,591

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931 4,255,358

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243 4,255,359

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D3—	39	258,470	D7—	6	258,483		388	258,495		23	258,509			258,522		56	258,533
	71	258,471		9	258,484		399	258,498	D18—	22	258,510			258,523			258,534
D6—	85	258,473		47	258,485		439	258,496	D19—	90	258,511		26	258,520		62	258,535
	86	258,472		132	258,486	D10—	104	258,499		100	258,512		28	258,524	D25—	74	258,537
	88	258,474		210	258,487	D12—	60	258,500	D20—	4	258,513			258,525			258,538
		258,475	D8—	98	258,488		155	258,501		42	258,514		43	258,526		92	258,536
	125	258,476		333	258,489		170	258,502	D21—	166	258,515		72	258,530	D26—	46	258,539
	144	258,477	D9—	370	258,490		211	258,503		236	258,516		77	258,527	D27—	51	258,540
		258,478		375	258,494			258,504	D22—	19	258,517		90.1	258,528	D28—	31	258,541
	184	258,479		376	258,492	D13—	40	258,505	D23—	23	258,518		97	258,529		83	258,542
	200	258,480		377	258,497	D14—	53	258,506		25	258,519	D24—	10	258,531	D30—	1	258,543
	201	258,481		378	258,491		66	258,507			258,521		49	258,532	D99—	27	258,544
	204	258,482		385	258,493	D15—	1	258,508									

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(First number in listing denotes location according to above key. Refer to patent number in body of the Official Gazette to obtain details as to inventor name, location, etc.)

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